New LANscape While Cisco leads most LAN switch categories, it's seeing stiff competition from low-end competitors. PAGE 15.

Super supply chain Promising to save billions in supply chain costs, UCCnet is gaining big-name backers. PAGE 19.

NetworkWorld

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July 7, 2003 ■ Volume 20, Number 27

CA event to highlight on-demand computing

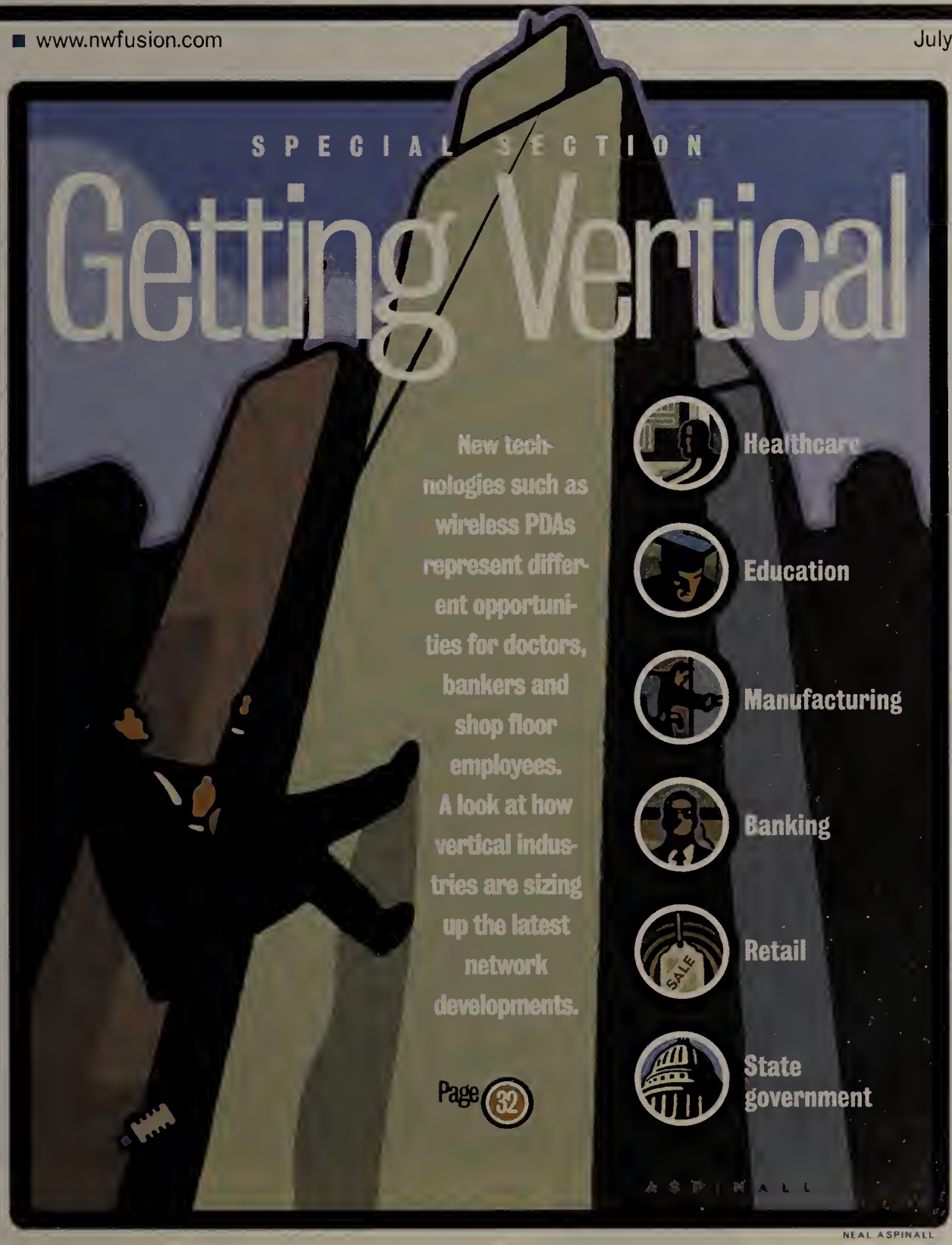
■ BY DENISE DUBIE

At its annual customer conference next week in Las Vegas, Computer Associates will flesh out its strategy for managing on-demand computing environments — a software-centric effort the company says is more flexible than the hardware-driven plans of rivals HP and IBM.

Industry watchers say CA will address key requirements such as virtualization, provisioning and configuration management. On-demand, or utility, computing refers to the idea of pooling system resources and dynamically allocating them to meet shifting demands instead of the traditional practice of assigning resources to applications. The latter has resulted in computing environments that often are 75% underutilized, when the ideal would be systems that are engaged actively 80% of the time.

CA won't reveal what it plans to announce at CA World 2003, where it anticipates 10,000 attendees. But last week it did announce a few additions and upgrades to its Unicenter management line that it positioned as

See CA, page 8



Big players push IPv6, but masses still resist

■ BY PHIL HOCHMUTH AND TIM GREENE

When the dominant maker and a powerful buyer of network gear — Cisco and the Pentagon — insist the time has come for IPv6, some might see it as marching orders for the industry.

However, IPv6 — ratified as a draft standard in 1998 — still represents the classic "ain't broke, don't fix" scenario for most U.S. companies. Why throw a wrench into networks that took years to build and fine-tune?

■ **ISP Verio makes its entry into IPv6 arena. Page 21.**

Proponents say that risk is justified by advanced IPv6 services such as improved security and mobility support, benefits that laggards stand to miss the longer they delay. And, of course, there's the shrinking pool of IP addresses, a problem IPv6 promises to fix.

Interest in IPv6 was sparked at a recent conference in San Diego, where the U.S. Department of Defense announced it is making IPv6 a procurement

See IPv6, page 10

ID mgmt. poised for next stage

■ BY JOHN FONTANA

Existing identity management practices and standards in combination with Web services security protocols will provide needed protection to support distributed computing between corporations and their partners.

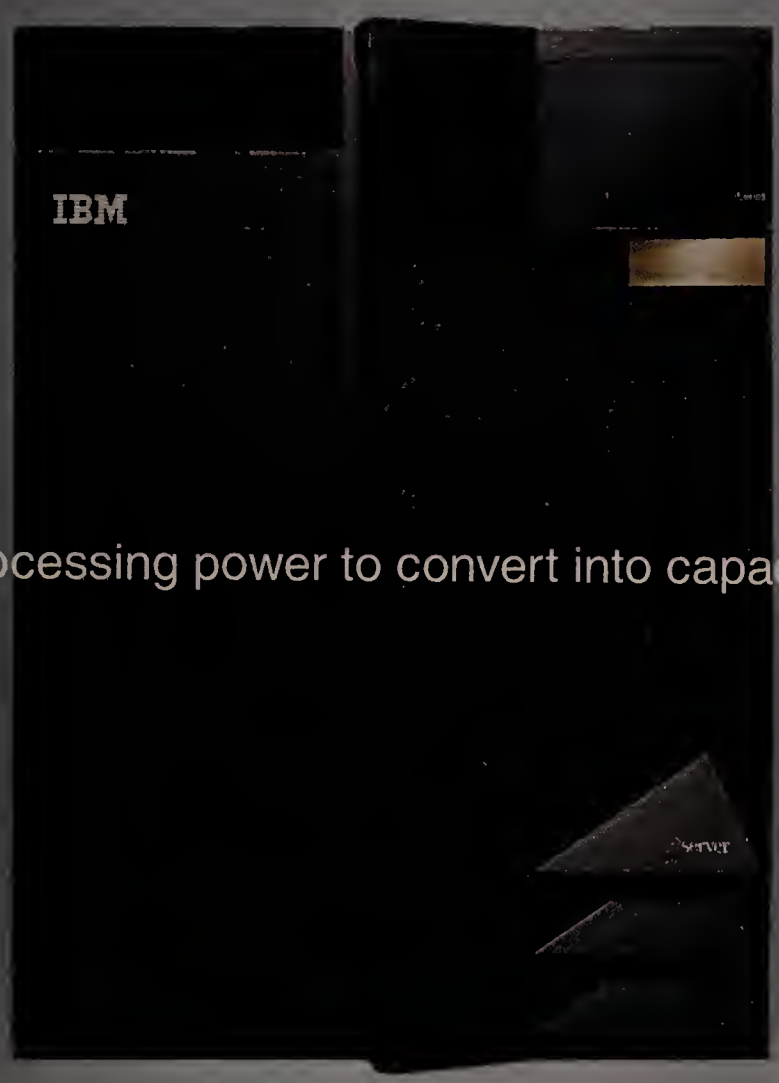
That concept, and the ultimate benefits for corporate users, will be main themes at the annual Burton Group Catalyst Conference, which officials say could host 1,200 attendees this week in San Francisco.

The conference also is expected to showcase vendor announcements of a number of identity management products, and the

See Catalyst, page 12

@server

IBM



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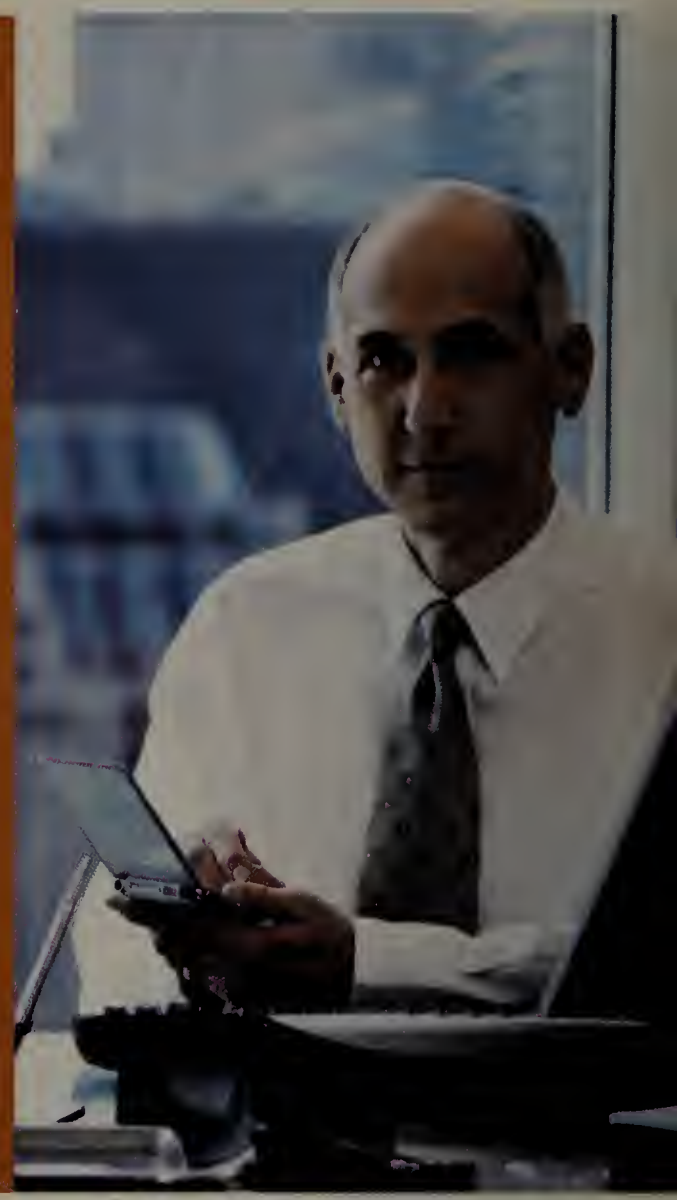

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NetworkWorld

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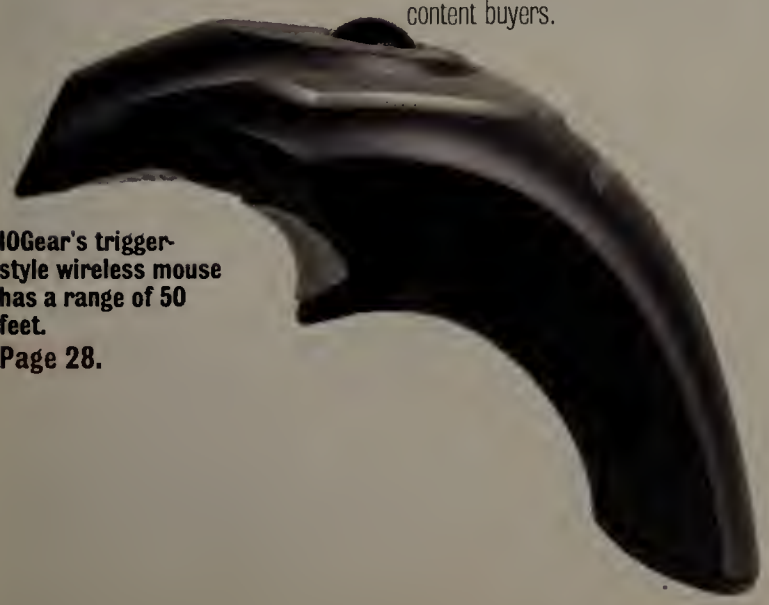

IOGear's trigger-style wireless mouse has a range of 50 feet.
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Interactive

Wireless Wizards

Will wireless work with heavy traffic?
In our newest Fusion-exclusive column, each week our Wizards will answer your tough enterprise wireless questions. This week, Mark in New York wonders how he can ensure that his WLAN will continue to perform optimally under heavy traffic load.
DocFinder: 6634

Network Encyclopedia

New definitions in the Networking Encyclopedia include ACORD XML, SMI-S and stackable switches. Check out these and other definitions.
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Audio primer: Digital Rights Management

Find out what 10 things you need to know before implementing Digital Rights Management in your enterprise.
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Seminars and events

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Compendium

The next-gen Web browser
Fusion Executive Editor Adam Gaffin directs you toward ideas on the Next Big Things in Web browsers, including a list of possibilities from the Microsoft and the Mozilla camp.
DocFinder: 6635

Telework Beat

What's next for Wi-Fi?
Net.Worker Managing Editor Toni Kistner tells you to expect reliable multimedia capability early next year.
DocFinder: 6636

Small Business Tech

Making sense of servers, Part 1
Columnist James Gaskin offers advice for what to do when you outgrow your peer-to-peer network.
DocFinder: 6637

Digital Domicile

New group aims to ease standards bloat
Columnist Mike Wolf wonders whether the Digital Working Group will ultimately make things better or worse.
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News Bits

Court sides with ex-Intel worker

■ California's highest court last week decided that a former Intel employee did not trespass on Intel's IT systems by sending mass e-mail messages critical of the company to its employees. After leaving Intel, Kourosh Kenneth Hamidi helped form FACE (Former and Current Employees) Intel, a group that bitterly objects to and hopes to reform Intel's personnel practices. On behalf of FACE Intel, Hamidi sent to Intel employees six mass e-mail messages containing negative claims about the company, reaching as many as 35,000 people. Intel sued to prevent Hamidi from continuing his e-mail campaign and in November 1998 won an injunction against him. The case eventually reached the California Supreme Court, which overturned a lower court's ruling. Because Hamidi did not hack into Intel's systems to send his messages, and because he removed any recipients who asked not to be contacted again, the court decided that he "did nothing but use the e-mail system for its intended purpose — to communicate with employees." Intel is considering an appeal.

Nextel snaps up MCI's fixed wireless

■ Nextel is buying MCI's fixed wireless service assets for $144 million. MCI, formerly WorldCom, filed a motion with the U.S. Bankruptcy court in the Southern District of New York last week that states wireless service provider Nextel was the top bidder in an auction to sell off MCI's wireless assets. Industry watchers weren't surprised that the carrier was selling its fixed wireless network and spectrum. MCI, which has been in bankruptcy proceedings for nearly a year, previously stated its plans to ditch some of its wireless assets before emerging from bankruptcy sometime in September. The carrier did not come close to the $400 million it spent on picking up wireless Multichannel Multipoint Distribution Service carrier CAI Wireless in 1999. Yet MCI was able to more than double the best offer from BellSouth.

WLAN hot spots seen doubling by '05

■ The number of wireless LAN hot spots worldwide will more than double by 2005, but the services are unlikely to reach "critical mass" until three to five years from now, according to Ken Dulaney, an analyst at Gartner. Potential fans of hot spots, where Internet access is available to users of notebook PCs and other devices equipped with IEEE 802.11 technology, are frustrated by the limited number of hot spots available and the lack of consistency among billing systems, Dulaney says. The report forecasts there will be about 71,000 hot spots worldwide this year, up from about 14,800 in 2002 and 1,200 in 2001. The number of hot spots will grow to about 152,000 in 2005, according to Gartner. There will be 9.3 million visitors to hot spots in 2003, up from 2.5 million in 2002, Gartner says.

COMPENDIUM

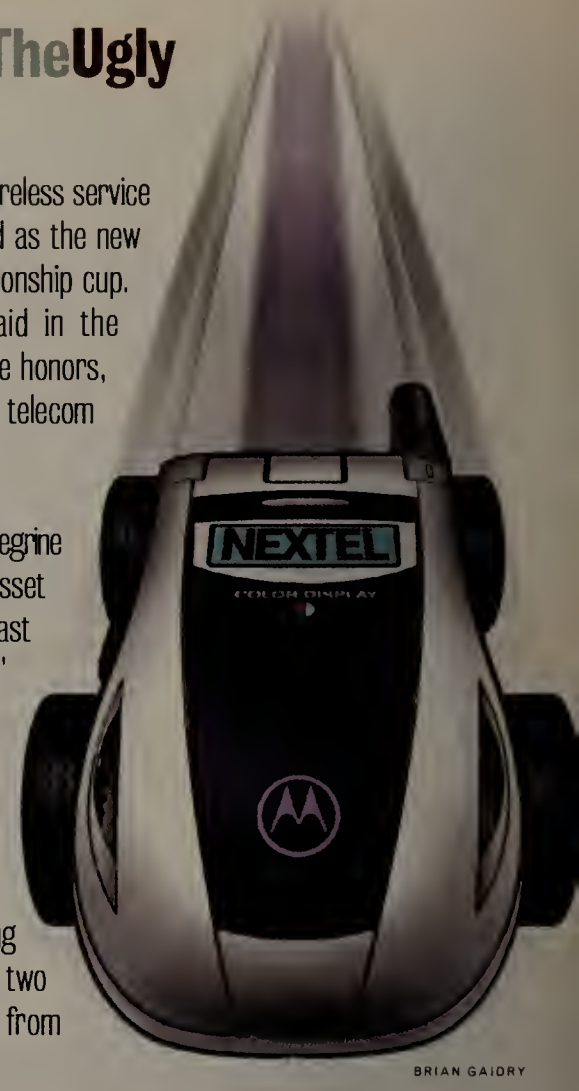
On considering Linux

Maybe it's not Microsoft that should be worrying about Linux as much as Sun. Mike Kruckenberg is in charge of a server upgrade at his shop, which currently runs on Solaris. But he's begun looking at non-Sun Linux boxes as an alternative.

Read his analysis at www.nwfusion.com, DocFinder: 6633.

■ TheGoodTheBadTheUgly

Start your engines. Wireless service provider Nextel has been announced as the new title sponsor of the NASCAR championship cup. Reportedly, the company has paid in the neighborhood of $750 million for the honors, a sign perhaps that at least some in telecom aren't hurting too badly. ➤



BRIAN GAIDRY

Piling on Peregrine. Peregrine Systems, the Chapter 11-protected asset and service management company, last week was charged with "massive fraud" in a lawsuit filed by the Securities and Exchange Commission. A year-plus government investigation found that Peregrine cooked its books from April 1999 to December 2001. The company, which was on the road telling its comeback story to the press just two weeks ago, is shooting to emerge from bankruptcy protection this summer.

Inferior Interior. A federal judge has forced the Department of the Interior — for the second time — to shut down some of its Web sites out of fear they could be hacked into and that the American Indian funds that the department manages could be put at risk. The department has appealed the ruling.

Fraud victims could receive more from MCI

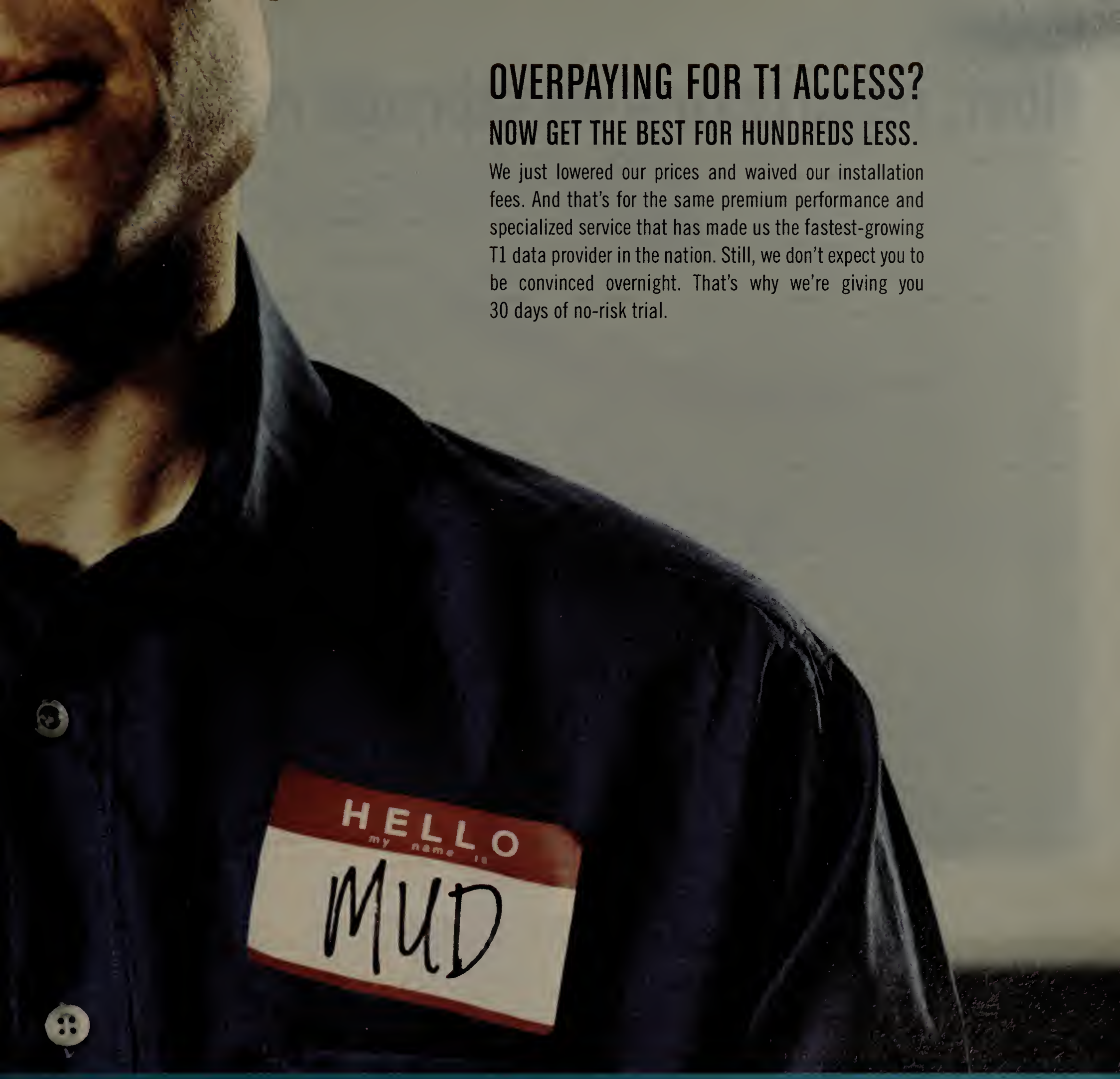
■ Victims of MCI's fraud could receive 50% more compensation if the courts approve a modification of settlement terms that the Securities and Exchange Commission proposed last week. The SEC modified its proposal for a settlement of its claim for a civil penalty against the company, still legally known as WorldCom, asking that the company contribute stock worth $250 million, in addition to the $500 million in cash already required, to compensate victims of its fraud. MCI was guardedly positive about the modified proposal. "We appreciate the efforts of everyone involved in reaching this decision, which remains subject to court approval," CFO Bob Blakely said in a statement. "We believe that it is another significant step toward MCI's emergence from Chapter 11."

Court blesses takeover of Global Crossing

■ The court overseeing the reorganization of bankrupt telecom carrier Global Crossing Holdings has approved the takeover of the company by Singapore Technologies Telemedia. The U.S. Bankruptcy Court for the Southern District of New York approved a change in the deal whereby ST Telemedia will pay $250 million for a 61.5% stake in Global Crossing, rather than sharing the acquisition with Hong Kong's Hutchison Telecommunications. The court has made the reorganization agreement exclusive until Oct. 28; no other potential investor can enter into negotiations to buy a stake in Global Crossing until that date unless ST Telemedia backs out of the deal. Global Crossing operates a fiber-optic network that connects 27 countries and about 200 cities, but collapsed under the weight of its debt and filed for Chapter 11 bankruptcy protection in the U.S. in January 2002. The deal still has to pass U.S. regulatory hurdles.

Medical records to be standardized

■ The U.S. Department of Health and Human Services last week upped the ante on a nationalized electronic medical-record system for healthcare providers. HHS announced that it will seek a medical vocabulary system that standardizes the terms used in medical records information and that it will provide a standardized medical record that physicians and IT administrators can use to build electronic medical record services. HHS will work with the College of American Pathologists to codify more than 340,000 medical concepts. They have commissioned the Institute of Medicine, a nonprofit arm of the National Academy of Sciences, to build the standard medical record.



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Govt. regs taxing on storage resources

■ BY DENI CONNOR

Complying with government regulations is taking an increasing toll on IT storage budgets and resources, analysts say.

Businesses are spending a majority of the money earmarked for storage on software and hardware that lets them comply with the thousands of rules and regulations enacted by federal and state legislative bodies.

"It's the only thing that's driving customers to buy anything this year, because it's mandated that they spend money," says Jamie Gruener, senior analyst for The Yankee Group.

Spending on hardware, software and services related to storage compliance will exceed $6 billion over the next four years, according to a recent Enterprise Storage Group report.

Mark Moroses, senior director of technical services and security officer at Maimonides Medical Center in New York, says the cost of storing compliant data — in his case, diagnostic images and medical records — is increasing dramatically.

"We anticipate increasing our expenditures [for archiving and retaining data]," Moroses says. "Each usage needs to also be evaluated on its own merits, but regulatory need is an important factor." Moroses has 7 terabytes of data he needs to keep. He says it will increase to 26 terabytes over the next four years.

Rich Banta, senior enterprise systems engineer for St. Vincent Hospital and Health Services in Indianapolis, expects his compliant storage needs will quadruple as a result of the Health Insurance Portability and Accountability Act (HIPAA) rules and other regulations.

"Not only are we regulated by HIPAA, but by the Joint Commission on the Accreditation of Healthcare Organizations and ISO 17799," Banta says. ISO 17799 is a standard that gives organizations best-practice guidelines for information security.

Whereas many organizations responded to the Sept. 11 terrorist attacks by voluntarily allocating more money to disaster recovery, Gruener says, customers now are compelled to develop methods and plans for archiving records the government considers critical. There is the very realistic chance that their businesses will lose money because of data loss or incur fines or penalties imposed by the government, he says.

"There is more of a mandate to be ready for compliance than there was for disaster recovery," Gruener says. "There were no regulations for disaster recovery until some of the compliance regulations like HIPAA mandated them."

Recently, six firms were fined $8.35 million by the Securities

See Compliance, page 11

Compliance-heavy industries

Four vertical markets are affected most by government regulations on storage retention, archiving and retrieval.

Vertical market	Storage regulations	What is required
Financial services	Securities and Exchange Commission 17a-3&4	Retention, retrieval and archiving of electronic records, including e-mail.
Healthcare	HIPAA, JCAHO, ISO 17799	Mandates disaster-recovery and data back-up plans, and enforces authentication and encryption of patient health information.
Life sciences/ pharmaceutical	Food & Drug Administration 21 CFR Part 11	Dictates how records are retained, shared and exchanged.
Government agencies	Department of Defense 5015.2	Companies use DoD-compliant software and hardware.

CA

continued from page 1

part of its on-demand scheme, first unveiled in April at NetWorld+Interop. These offerings, which include a tool for overseeing wireless LANs and an upgraded mainframe manager, fit the on-demand computing profile in that they will help customers get a better view of their IT resources so as to better make use of them, CA officials say. For instance, Unicenter NSM Wireless Network Management Option 3.0 provides an integrated console for tracking wireless and wired networks.

"[We] are trying little by little to make CA and Unicenter the management specialist in enterprise networks," says Gale Persil, director of Unicenter network management at CA. "The more intelligence we add to our software, the more adaptive equipment makers make their gear, the more we can address this bit by bit. And I say bit by bit because you get throttled back by customers that are a little bit afraid of the software taking over their machines."

CA officials emphasize that the company's on-demand computing strategy is not tied to any particular brand of hardware and will not require customers to overhaul their systems or networks.

"CA is taking into account the diversity across enterprise infrastructures," says Jean-Pierre Garbani, a director with Forrester Research. "The company is not telling customers to standardize on any one type of equipment, but it will manage heterogeneous resources with software."

Analysts say CA is competing against companies such as BMC Software to get the early lead in managing on-demand computing environments, which most companies are still in the very early stages of building.

CA's product plans prove the company is committed to a software-only approach to on-demand computing, says Jasmine Noel, principal at research firm JNoel Associates. She says CA, and competitor BMC, this year announced advancements in their management software that could enable on-demand computing.

"The race is on to try to tie software-distribution tools with performance-management tools so that customers can more directly manage IT as business demands it on the fly," Noel says.

BMC earlier this year announced its plans to manage business services after it acquired IT Masters, which developed technology that BMC now uses to help customers create models of business services. CA has yet to develop or acquire the modeling technology to rival BMC's, Noel says, but the company is providing more automation in Unicenter and using its business-process views to help customers start aligning IT closer with services.

Makers of hardware and software such as IBM and HP, meanwhile, focus on the idea of virtualizing all the resources across a network and making several machines act as one super-machine. Despite coming at on-demand computing from a different perspective, CA still will find itself battling these companies and that will prove challenging, analysts say.

"It's one thing to compete with OpenView or Tivoli. It's a completely different thing to compete with HP and IBM," she adds.

While CA is making incremental advances by adding automation and service views across its management software products, the company isn't quite up to speed on all the technology it will need to provide customers with on-demand computing management capabilities. One area it will need to address is virtualization, analysts say.

Industry experts say virtualization technologies in both server pools and storage networks are pivotal to deploying an on-demand computing network. Software from companies such as Connectix, SW-Soft and VMware lets Intel servers emulate the software-partitioning and virtual-machine capabilities of bigger Unix servers from HP, IBM and Sun, and mainframes from IBM.

It's companies such as these that have gotten customers' attention early on regarding on-demand computing.

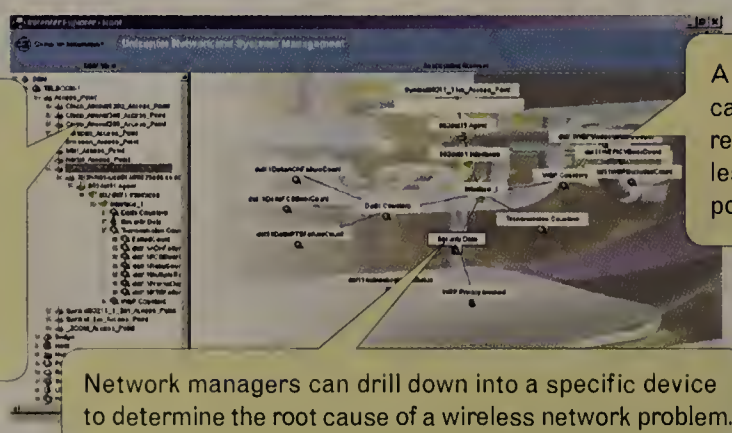
"We are not looking at CA right now for any of these functions," says Chris Holbert, director of IT at North American Scientific in Chatsworth, Calif., and a user of Unicenter for monitoring network devices and remote offices. "We are looking at virtualization and on-demand computing, but [from] different vendors ... mainly VMware."

IBM says it will come out with WebSphere software that will let companies manage business applications running on different servers as a single environment. And HP unveiled in May details of its HP Virtual Server Environment, software that the company says allocates virtual resources in response to application demand and was built on the latest version of HP-UX Workload Manager.

"CA is a bit behind HP and IBM in terms of virtualization, and they are only scratching the surface of virtualization," says Corey Ferengul, a vice president with Meta Group. ■

Wireless window

Unicenter NSM Wireless Network Management Option 3.0 gives users of CA's flagship management program a view into wireless LANs.



The software can locate wireless access points, identify rogue users and report on wireless LAN performance on 802.11 networks.

Areas of poor performance can be identified, and the relationships between wireless devices and access points can be shown.

Network managers can drill down into a specific device to determine the root cause of a wireless network problem.

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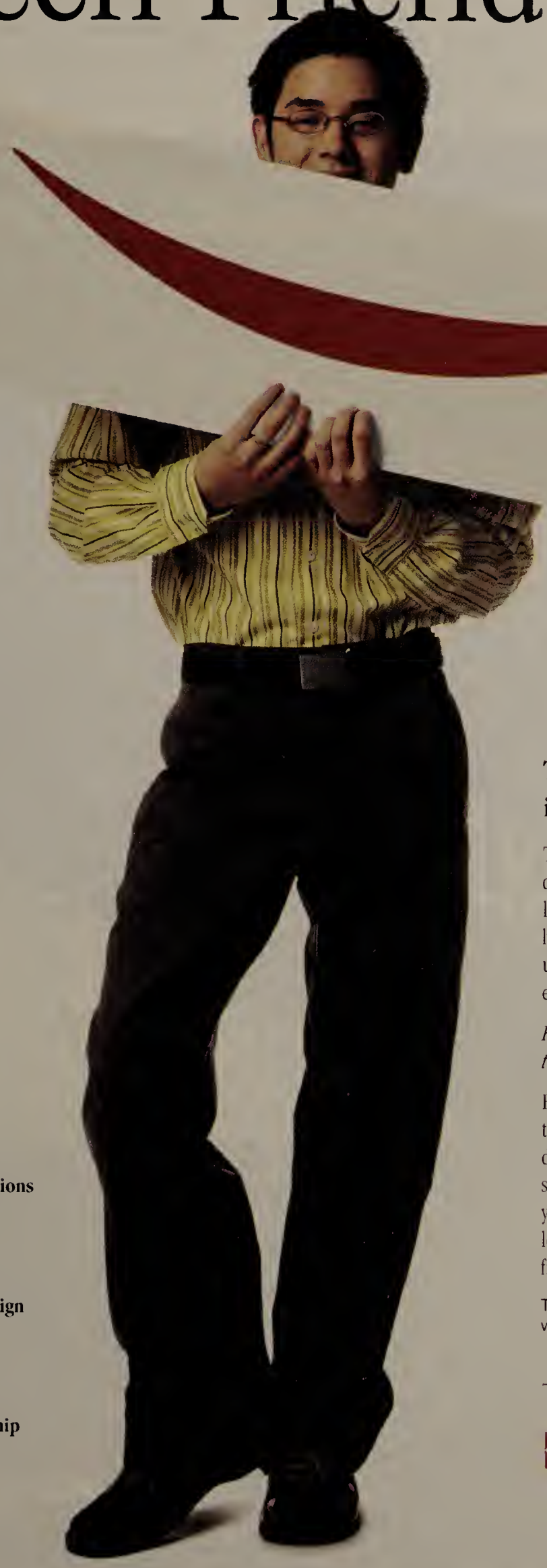

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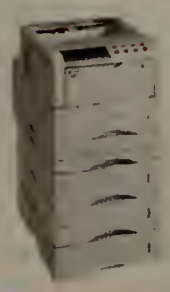

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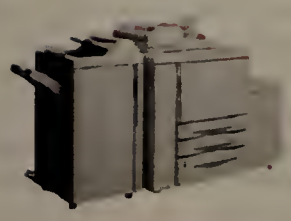

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IPv6

continued from page 1

requirement. Cisco also recently extended its support of IPv6 from router and switch gear to firewall products.

Department of Defense CIO John Osterholz said his organization will start requiring support for the protocol starting in October. And by 2005, all Department of Defense networks will be fully interoperable with IPv6 networks.

That requirement is a boost for the technology, given that the Defense Department's IT budget is $30 billion, says Alex Lightman, chairman of the North American Global IPv6 Summit, where Osterholz spoke. "There is no budget like it. It is the 800-pound gorilla saying, 'Go to IPv6,'" he says.

One military IT professional who will be on the business end of the Defense Department's mandate is Commander Jeff White, information warfare officer for the Navy Warfare Development Command.

"IPv6 effectively opens the floodgates" with respect to new security and features, says White, who is responsible for deploying new network and security technologies on Navy ships. While not commenting directly on the Department of Defense mandate, he adds that his group has gotten a jump on the IPv6 issue. "We're already assuming that IPv6 will be out there and employed," he says.

Unlike at the Defense Department, ramping up IPv6 networks is less of a priority for businesses and organizations not involved in defense, experts and users say.

"Nothing is going on from the enterprise perspective" regarding IPv6, says Lawrence Orans, principal analyst at Gartner. "The [Department of Defense] is one enterprise that's obviously unique, but for regular companies and businesses, this is not on their radar screens."

Orans adds that U.S. companies "are not feeling much pain with IP Version 4," so there is little motivation to migrate.

That seems to be the prevailing view in the trenches.

"We are one of the lucky holders of a Class B IP network," says Bruce Meyer, senior network engineer at ProMedica Healthcare in Toledo, Ohio. A Class B license lets his organization have 65,024 unique IP addresses. It also means ProMedica won't be looking into IPv6 for a while.

IPv6 also is a back-burner issue for Sheng Guo, CTO for the New York State Court System.

"It's something we're going to look into, but not in the immediate future," he says.

Greater difficulties, he says, include managing and troubleshooting new applications, such as IP voice and video, over a recently installed statewide optical Ethernet infrastructure. Running out of IP addresses is not his biggest concern.

The perceived cost is one deterrent to IPv6, experts say.

"There is an inherent cost to rolling out IPv6," says Martin McNealis, Cisco's senior director of product management for IOS. He says this cost involves upgrading IP stacks on network gear, in applications, and end nodes such as PCs and servers.

"We're trying to mitigate that on the network side with [IPv6] integration efforts," into Cisco product lines, he adds. This includes complete support of IPv6 across all Cisco routers, and the recent announcement of IPv6 support in firewalls. Other vendors with routing gear that supports IPv6 include Foundry Networks, Fujitsu, Hitachi, Juniper and NEC.

Another factor against IPv6 is simply that there is little need, because U.S. businesses and governmental organizations have addresses to burn.

"The corporations and carriers in the U.S. have sufficient addressing for the next few years," McNealis adds, "and don't feel the same addressing crunch as Asia and Europe do."

For example, Level 3 Communications has three Class A domains, which is about 48 million unique IP addresses.

"That's almost more than all of Asia has," says Sylvia Hagen, president of the network consultancy Sunny Connections and author of the book *IPv6 Essentials*.

"If you go to Asia, you will see many commercial and production IPv6 networks because they have no other choice," she says.

Another reason for the lack of interest in IPv6 among U.S. companies is that there are many workarounds to extend the life of IPv4 address use. Many of the network shims have become common IT practices.

"The industry has gotten very good at dealing with IP addresses," says Douglas Comer, a professor of computer science at Purdue University and author of the book *Internetworking with TCP/IP*.

Comer says technologies such as network address translation (NAT) and Classless Interdomain Routing (CIDR) have made it much easier to live with IPv4. NAT used on firewalls and routers lets up to 257 nodes in a corporation sit behind a single IP address. CIDR lets the grouping of separate IP networks appear as part of a single subnet. This lets service providers conserve addresses by divvying up pieces of a full range of IP addresses to multiple customers.

But while NAT staves off the need for more addresses, this is done at the sake of the improved security IPv6 could provide, some say.

"IPv4 cannot take us into the next century," says Jim Bound, chair of the North American IPv6 Task Force and a staff fellow at HP. He adds that NAT as the answer to address shortage "is kind of an illusion. We're keeping [IPv4] alive with chewing gum."

Besides security snafus, NAT can hinder network management, one user says.

"A lot of networks are turning to NAT to solve their IP [address] problems, but it's not without" its own issues, ProMedica's Meyer says. One issue is network management and troubleshooting. "Just try and Traceroute through a couple of routers doing NAT," he says.

Included in the IPv6 standard is support for native IP Security (IPSec), which is retrofitted into IPv4 as an add-on.

"IPv4 breaks down when you have NAT, but with [IPv6] you can do end-to-end security with no single point of failure," he says.

This could shake things up for IPSec VPN and Secure Sockets Layer (SSL) remote-access companies, and Layer 4 to Layer 7 switches makers, some vendor executives say.

If IPv6 becomes ubiquitous, there will be no need for IPSec clients, says Simon Johnson, vice president of technology for SSL remote-access vendor Aspelle. As a result, VPN gateways no longer will be needed between corporate networks and the Internet, because IPv6 machines will be able to tunnel directly to each other.

Meanwhile, IPv6 also could force Layer 4 to Layer 7 Web switches and load-balancing gear to evolve. Because the payloads of packets sent between any two IPv6 devices can be encrypted, these devices might not be able to identify what protocol or application they are carrying to set priorities, according to John Roese, CTO at Enterasys Networks.

Part of the necessity for IPv6 is the imminent onslaught of handheld wireless gadgets that will tap into the Internet — and thus, require IP addresses.

To support mobile devices, the Internet Engineering Task Force is nearing the completion of the Mobile IPv6 standard, which will let devices such as cell phones, and Wi-Fi- and 3G-enabled devices roam among various wireless networks while maintaining application or voice persistence. The magnitude of addresses that IPv6 provides could let all types of devices have their own unique IP addresses, from mobile routers embedded in cars to credit cards.

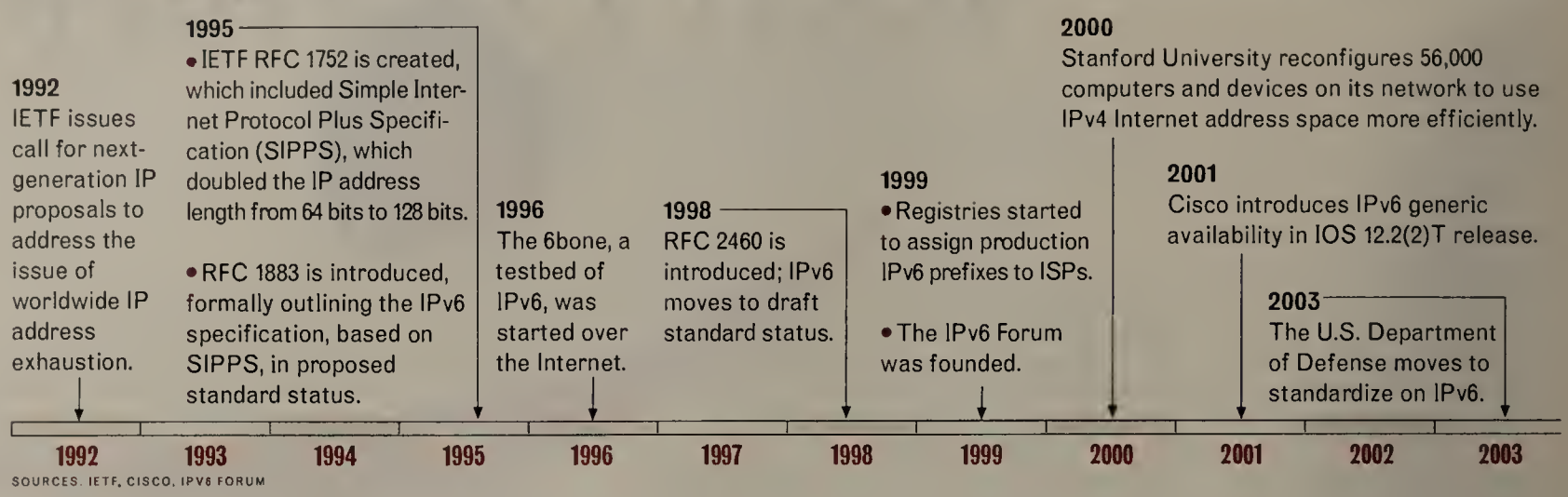
"The main reason companies will want to use IPv6 is not to solve problems that were in IPv4, but to take advantage of new features, such as mobility and security," Sunny Connections' Hagen says.

According Instat/MDR, shipments of Internet-enabled wireless devices — such as cell phones, PDAs and combination products — will go from 430 million in 2002 to 760 million by 2006. And each of those gadgets potentially will need IP addresses.

"Quite frankly, there are not enough addresses to support a billion handsets," says Bound, the North American IPv6 Task Force chair. "Service providers will need to adopt IPv6 to be prepared for such a large market." ■

IPv6 evolution

Where the next-generation IP came from:



SOURCES: IETF, CISCO, IPV6 FORUM

Compliance
continued from page 8

and Exchange Commission (SEC), Massachusetts securities regulators, the National Association of Securities Dealers and the New York Stock Exchange for failing to retain e-mail records or their inability to retrieve records.

The Health and Human Services Office, similarly, threatens organizations with fines of as much as $250,000 and 10 years in jail for intentionally disclosing confidential patient health information.

"The risk of non-compliance is real," says Peter Gerr, analyst with Enterprise Storage Group. "It's not an insurance policy like disaster recovery. It requires IT organizations to review what they are doing today and then really understand where they have to spend to close gaps or where they can delay spending."

Keeping compliant records is big business. Enterprise Software Group says the capacity of storage required for keeping compliant records will increase dramatically over the next three years. The research firm estimates that 376 petabytes of compliant records this year will increase to more than 1,644 petabytes in 2006, a compound annual growth of 64%.

Enterprise Software Group says compliant data has three characteristics that contribute to the swelling numbers: Data must be retained for longer periods of time; it must be readily accessible; and it must be capable of being accessed by a number of sources.

Jack Scott, managing partner of Evaluator Group, says that while recently there has been a lot of attention paid to compliant data, the data itself isn't new. The expenditures are just being shifted to new areas.

"Most of these megabytes and petabytes of storage have been here for years," Scott says. "All the stuff you are hearing about today is an evolution from records management disciplines and laws that have existed for years."

Compliant records traditionally have been stored on tape, optical disk, paper or microfiche/microfilm, where they were often difficult if not impossible to retrieve quickly. The records were the domain of records administrators, who were responsible for interpreting the regulations as they pertained to storage and who built audit logs of data accesses and modifications. IT managers only became involved when those records were imaged and the resulting data transferred to tape for archiving.

However, with the advent of Advanced Technology Attachment disk and software approaches to ensuring the quick access, auditability and authenticity of data, IT managers are turning to disk- and software-based approaches for data retention, Scott says.

"It's an opportunity that is in front of us," he says. "Mostly this is recognition that there are rules out there that mandate retention periods that the IT community, by and large, has been stiff-arming previously. Now all of a sudden the IT community is becoming aware of the legal rulings under which data must be stored."

Enterprise Storage Group says compliant data storage will shift from tape to disk fairly quickly. Disk-based storage represents the fastest-growing media segment, growing from 17 petabytes in 2003 to more than an estimated 350 petabytes in 2006. By contrast, tape-based storage will decrease from 75% use in 2003 to 64% in 2006 as disks take over as the primary archival medium.

It was only two months ago that the SEC realized its guidelines for data storage might be too restrictive. In an interpretive release issued in May of Rule 7a-3&4, the SEC removed any verbiage about the type of medium used. The new release says only that broker-dealers can use a hardware/software combination that prevents the overwriting, erasing or altering of a record during its required retention period. ■

Catalyst

continued from page 1

Organization for the Advancement of Structured Information Standards (OASIS) will hold an interoperability test focused on Service Provisioning Markup Language (SPML) and announce ratification of the specification.

The Catalyst conference, now on its 10th edition, has been at the forefront in espousing the benefits of directories and most recently the concept of a virtual enterprise network, in which network boundaries between companies are blurred.

This year the focus is on identity management as a key to securing and managing the virtual enterprise network. Identity management is defined as a set of business processes and an infrastructure for the creation, maintenance and use of digital identifies under strict policies and legal constraints.

A milestone in the evolution of the virtual enterprise network concept is coming up on corporate IT executives who believe that digital identities and identity-based security and policies are fundamental for the next era of distributed computing based on Web services.

"It's fair to say we have exploited the existing generation of Web-enabled identity infrastructure about as well as is possible," says Jamie Lewis, president of Burton Group. That infrastructure consists of directories, Web access management products for single sign-on, provisioning, and delegated and self-service administration.

"Low- to medium-value applications are fairly pervasive. You can log into Web sites, you can get self-service interfaces, but if we really want to take it to the next level with higher-value transactions, more automation of processes is needed," Lewis says.

Those automated processes will rely more on federated identity, a concept that lets identity credentials be shared across corporate boundaries.

The important evolution, however, is to go beyond identities just for end users and use identity for applications and services so applications can talk securely to other applications, so Web services can talk to Web services and Web services can talk to applications.

"We can't do that without stronger security, and one of the first predicates for stronger security is well-formed and well-understood forms of identity," Lewis says.

Those identities will be tied to users, applications or computers. "Identities can be linked with policies that govern activity and draw boundaries around acceptable and allowable use," he says.

Customer-driven

The need for this broader scope of identity management is being driven by corporate executives who see the value in digital identity as they tune IT systems to comply with recent legislation such as the Sarbanes-Oxley Act, the Graham-Leach-Bliley Act and the Health Insurance and Portability and Accountability Act.

"We are getting into identity management to manage objects and environments; it goes beyond people and extends to machines, applications and the network," says Fred Wettling, chairman of the board for the Network Applications Consortium (NAC) and infrastructure architect for Bechtel.

NAC is an end-user organization focused on IT infrastructure and the interoperability and manageability of business applications linked across disparate platforms.

Wettling says identity has its benefits for user access but also allows for operations such as uniquely identifying computers and their components to check for license compliance. He cites other benefits such as securely tying together applications and reusable components to support quality-of-service policies, and provisioning such as establishing the endpoints on a VPN.

The fringes of identity convergence can be seen today between identity management standards and Web services protocols of the future. But they also point to possible fragmentation.

The Liberty Alliance, which is developing a federated user-identity framework, now has as its foundation the Security Assertion Markup Language (SAML), an XML-based protocol for exchanging security information.

The next step in the process, Lewis says, is to converge current efforts with the Web services security protocol WS-Security. The Liberty/SAML combination already has embraced WS-Security, which is being developed at OASIS.

SPML will become another important ingredient in an identity management framework.

Another direction

But the creators of WS-Security, IBM and Microsoft, are taking the base WS-Security specification and building their own federated identity management framework with derivative protocols, such as WS-Policy, WS-Federation and WS-Trust, that overlap the scope of the Liberty Alliance effort. The two also have not supported SPML.

"We'll ask Liberty, IBM and Microsoft how they see their parallel development efforts converging, if and when the Liberty Alliance, SAML and WS-Security come together into a framework," Lewis says.

It's the same question on the minds of users.

"It's important for all this to come together, and the NAC wants the standards bodies to work together to resolve their differences," Wettling says.

Wettling and others agree that there is a lot of work to do before an identity management framework that extends across corporate boundaries is reality.

"Customers still have a lot to do to get their act together before any of this is valid," says Gary Loveland, a principal in the security and privacy practice at PricewaterhouseCoopers.

Loveland says corporations can use their portals to transition into Web services, but there are still areas outside the portal that have to be brought into the identity-based security model. "There is not a fix overnight, but there is an evolution," he says.

And that evolution includes a heavy dose of Web services.

The topic will dominate an entire day at Catalyst, with Anne Thomas Manes, the head of Burton Group's new Application Platform Strategies group, outlining how Web services will weave into IT including development tools, platforms, applications and overall infrastructure.

"The infrastructure is the most interesting," Manes says. "Today, you can build simple Web services to connect systems, but eventually you need scalability, reliability and security."

She says SPML and specifications under development for reliable messaging, management and business process workflow are critical.

"These are big impediments to taking Web services to the next level, as are solving vendor squabbles," Manes says. "We'll break those down and take a look at the road map and the potholes." ■

What's on tap

A number of vendors are planning announcements at Burton Group's annual Catalyst Conference.

Vendor/group	Announcement	Description
Neoteris	Neoteris Meeting Series	Web access control software now available on Linux.
Netegrity	SiteMinder	Suite of products to secure online meetings, collaboration across corporate boundaries.
Novell	Nsure Audit, iChain SAML extension	Audit data stores for events that might violate security policies; iChain extension supports SAML 1.0.
OASIS	Ratify Service Provisioning Markup Language specification	Provide a standard for integrating provisioning software into identity management frameworks; interoperability demonstration planned at show.
Waveset	Lighthouse Directory Master	Secure management of identity data across multiple directories.

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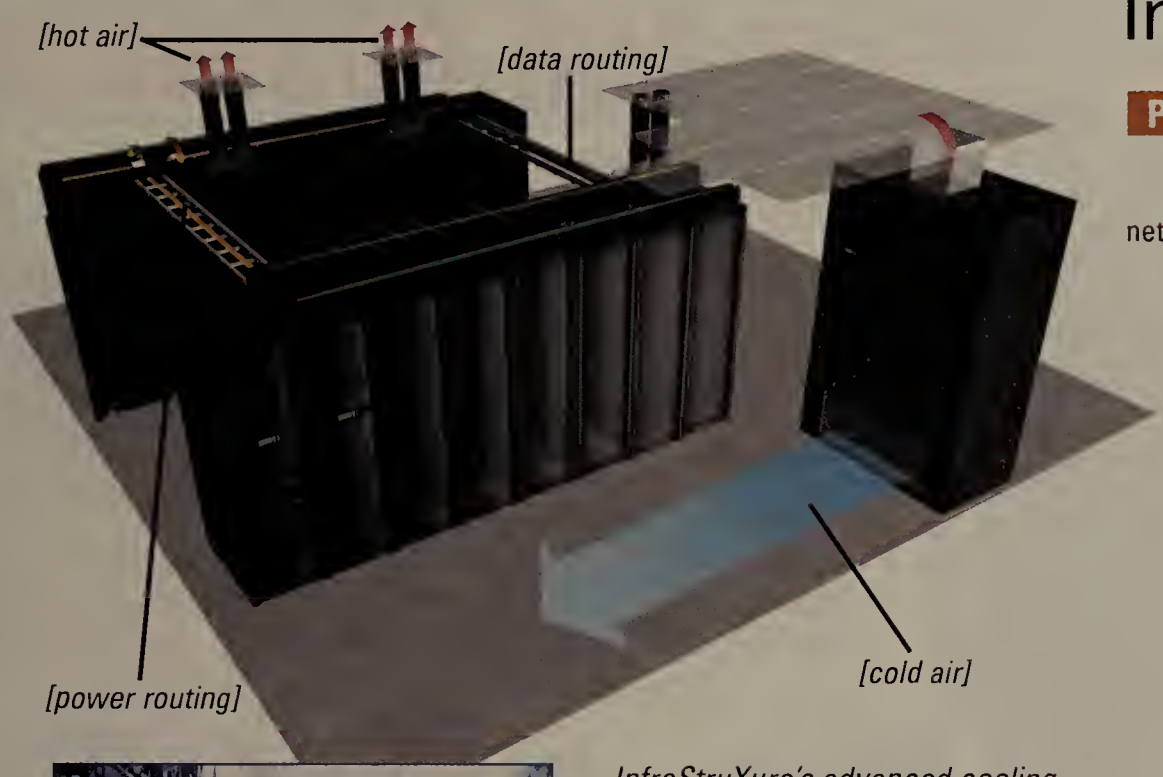

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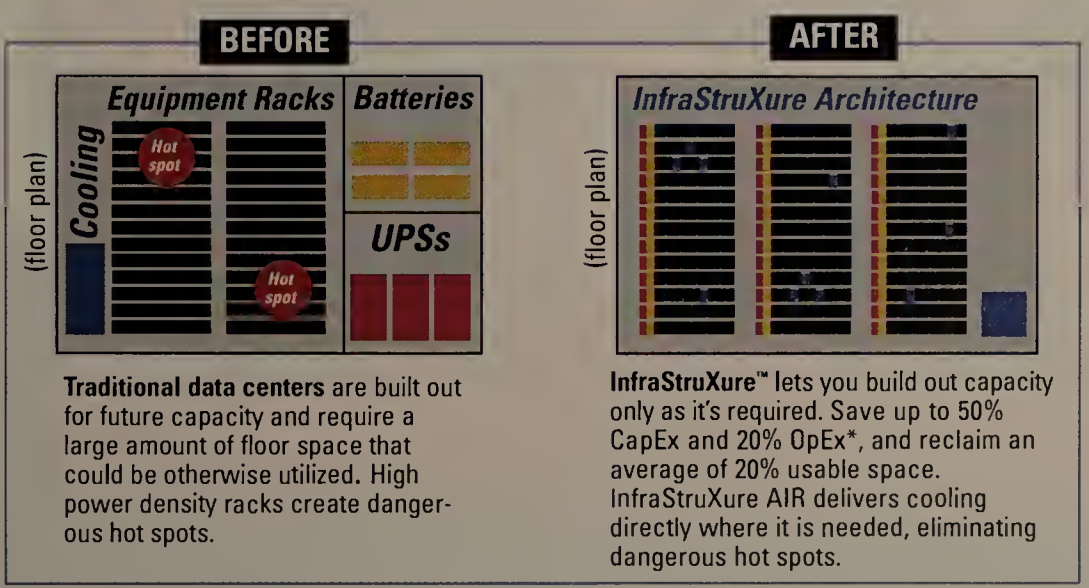
Vice President of Engineering
Rich Flanders
Director of Engineering
Time Warner Cable

"If I had purchased the incumbent vendor's 3-phase upgrade model, I would have paid 75% more in service costs over the next four years and I would have had to utilize 50% more of my precious floor space."

Captain Timothy Riley
Support Services Division
City of Newport Beach Police Department



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Short Takes

■ **SMC Networks** this month is expected to release new five- and eight-port **TigerStack Gigabit Ethernet switches** and Gigabit network interface cards aimed at small "power user" workgroups. The unmanaged boxes will support basic Layer 2 switching and triple speed — 10/100/1000M bit/sec — links over Category 5, 5e and 6 wiring. SMC says these switches and NIC products will be priced at about $25 per port.

■ **Microsoft** announced last week that its software driver for the iSCSI protocol is available. The iSCSI initiator service works with Windows 2000, XP and Server 2003 servers. The iSCSI protocol transports block-level storage data over IP networks. Gartner says that by 2006, more than 1.5 million servers will use iSCSI to connect to storage-area networks. Microsoft's iSCSI initiator supports IP Security, the Internet Storage Name Service and the Windows Management Instrumentation. It is available for download at no charge from www.microsoft.com/downloads.

■ **Veritas Software** said last week it has closed its $609 million acquisition of **Precise Software Solutions.** Veritas intends to use Precise's application performance-management software to expand its storage-focused software portfolio. Precise's i3 application performance management product and StorageCentral resource-management software have been renamed **Veritas i3** and **Veritas StorageCentral.** Pricing for the software will remain essentially unchanged for now, Veritas executives says. Throughout the next year, Veritas will work to integrate its products with Precise's; further details about that integration will be available later this year. Veritas also recently acquired server provisioning technology developer **Jareva Technologies.** One integration priority will be automating the connections between software from Precise and Jareva with Veritas' Cluster Server software.

The state of the LAN landscape

Cisco tops most categories, but sees increasing competition at high, low end.

■ BY PHIL HOCHMUTH

Market leadership in most LAN switch categories can be summed up in one word — Cisco. But a closer look at the numbers reveals some new developments taking place at opposite ends of the switch spectrum.

While Cisco leads most switch categories, the company is seeing fierce competition from a host of new lower-end competitors. New vendors also are emerging in some advanced switching categories, such as Layer 4 to Layer 7 and 10G Ethernet.

Basic Ethernet equipment has become a commodity for the most part, as the market for Layer 2 gear has shrunk by more than $2 billion over the last three years, going from $10.7 billion in 2000 to about $7.4 billion in 2002, according to IDC. This trend is expected to continue through 2007. The average per-port price of $57 in 2003 is predicted to be about $20 in 2007.

For more intelligent Ethernet gear, the revenue picture is a little brighter, as the Layer 3 equipment market is expected to grow, on average, 13% between now and 2007, while Layer 4 to Layer 7 equipment sales will continue strong, with 28% growth over the same time period. High-speed Ethernet, and Gigabit and 10 Gigabit also are expected to grow at a rapid clip — 10% and 43%, respectively, over the next five years, IDC says.

The leader in worldwide LAN switch market revenue last year was Cisco — no surprise. But analysts say a look at the Ethernet port shipment numbers paints a different picture of the market.

"People always talk about Cisco being the dominant player," pointing to the firm's 70% market share in LAN switch revenue, says Rachna Ahlawat, principal analyst with Gartner. "But they've always been around 40% to 50% in terms of port shipments. The rest of the market is being captured by commodity players, and their share is increasing."

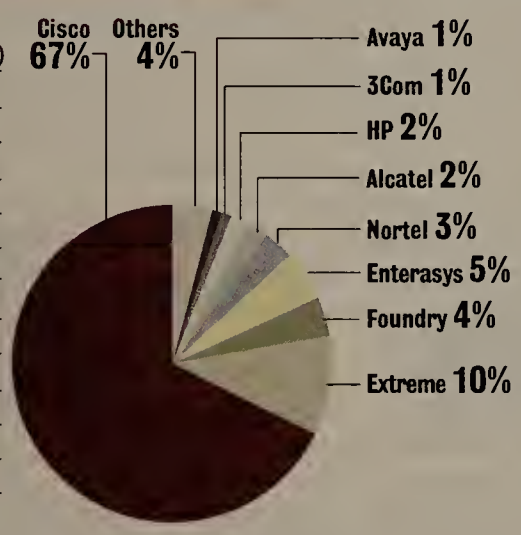
See Ethernet, page 16

Who's who in Ethernet

While Cisco has a dominant hold on standard enterprise LAN gear, such as Layer 3 and Gigabit switches . . .

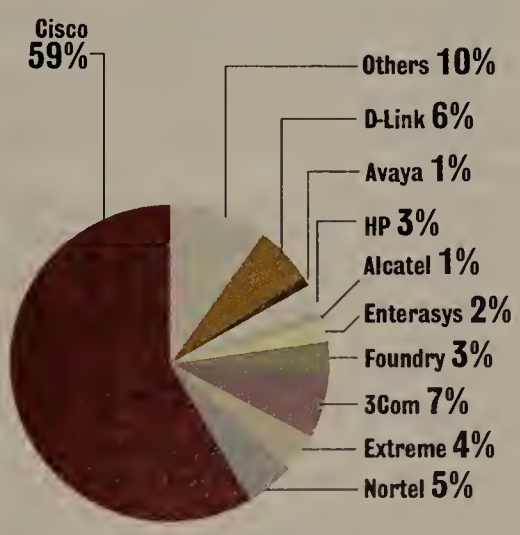
Worldwide Layer 3 LAN port shipments

	Port shipments (K)
Cisco	14,371
Extreme	2,107
Enterasys	1,059
Foundry	964
Others	963
Nortel	744
HP	439
Alcatel	406
3Com	298
Avaya	149
Riverstone	95
Total	21,595



Worldwide Gigabit LAN port shipments

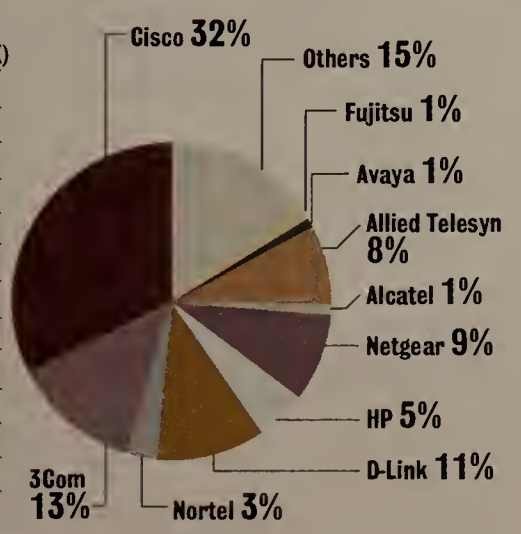
	Port shipments (K)
Cisco	4,404
Others	774
3Com	512
D-Link	443
Nortel	355
Extreme	270
HP	194
Foundry	186
Enterasys	124
Alcatel	93
Avaya	80
Total	7,435



. . . competition is more open at the low end and in specialized markets, such as Web switches and load balancers.

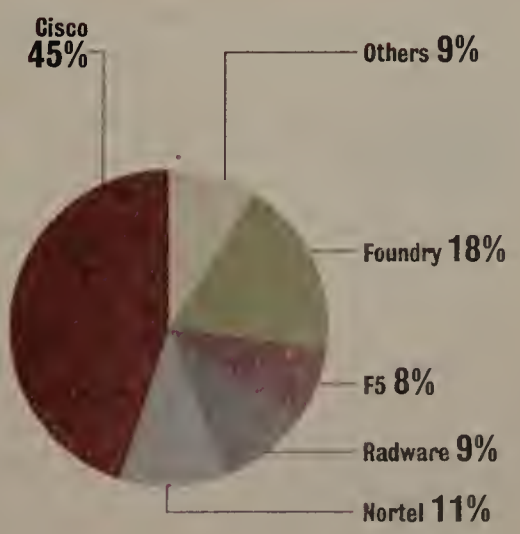
Worldwide Layer 2 LAN port shipments

	Port shipments (K)
Cisco	42,702
Others	19,676
3Com	16,898
D-Link	14,366
Netgear	12,442
Allied Telesyn	10,016
HP	7,072
Nortel	4,514
Fujitsu	1,802
Avaya	1,318
Alcatel	1,128
Total	131,934



Worldwide Layer 4 to Layer 7 LAN port shipments

	Port shipments (K)
Cisco	225
Foundry	88
Nortel	56
Others	45
Radware	44
F5	41
Total	499



All percentages are rounded.

SOURCE GARTNER 2002 FIGURES

TOLLY ON TECHNOLOGY

Kevin Tolly

Microsoft's Munich

Some three score years ago, a meeting in Munich played a pivotal role in determining the course of a world war. As that Bavarian city gets set to roll out Linux to the desktops of its 14,000 knowledge workers, it might evolve into the most important battle yet in the escalating war between Windows 2000/XP and Linux.

It is increasingly common to see "Linux in the enterprise" articles. When I saw the story in a recent edition of *The Wall Street Journal*, though, the word "desktop" jumped out at me. Linux at the desktop is almost unheard of. Clearly, the technology planners believe that costs will be lower and productivity higher.

The story's mention of Munich's bureaucrats sent my mind back to the mid-1980s when I was technology manager for BMW of North America doing an overseas stint. Certainly, productivity wasn't high back then. To be "legal," I needed both a work permit and a visa. All I can remember is that I had to have a visa before I could get a work permit and a work permit before I could get a visa.

While Munich is neither the world's largest city nor the most complex computing environment, it is a "marquee" account. Should the conversion be successful, a lot of large companies would see Linux in a whole new light. Conversely, should the project be scrapped — Linux fails to deliver — and Microsoft comes in to save the day, "Remember Munich" will become the slogan on every Microsoft salesperson's lips.

I bet that the project will be successful — ironically in no small part because of work that Microsoft has done to Webify its applications. It has integrated Web technology so effectively into its key products that, even without Microsoft technology at the desktop, Linux end users still can conduct usual, Microsoft-centric "corporate" computing.

Microsoft Exchange provides a perfect example. While I don't know whether this is an issue in Munich, Exchange is the e-mail of choice for vast numbers of businesses and government agencies worldwide. For them, a solution without Exchange and its Outlook client is no solution at all.

It is no surprise that Microsoft's "flagship" Outlook client always has been built on the native Windows operating system. Some years ago, Microsoft first bent to the will of the 'Net by creating a terrible active server page implementation of the Outlook client that it called Outlook Web Access. This was built largely in recognition of the fact that synchronizing Outlook across low-speed links was impractical if not impossible.

Today, with Exchange 2000 and 2003, the Web-based Outlook client has been re-architected and vastly improved. And, while not 100% identical to the native Outlook, it is quite good and far better than "good enough."

Beginning with Exchange 2000, the Exchange database has been re-architected as the "Web store." This lets e-mail objects be directly addressed via URL from any authorized application and throws the Exchange database wide open for homegrown or third-party applications to utilize it.

Companies uncomfortable with the Web approach to key applications can use the thin client provided by Microsoft's Terminal Services, Citrix Systems' MetaFrame XP or Tarantella/New Moon.

Using these products, end users with Linux machines can run Win 2000/XP desktop applications without the need to run a Microsoft operating system on their desktop devices.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com.

VMware increases control of virtual server resources

■ BY JENNIFER MEARS

VMware, which specializes in software that carves multiple virtual servers out of single physical boxes, has introduced a product that promises centralized control of those systems. It also is readying software that will let users move virtual machines among physical servers in response to resource demands.

VMware Control Center, which is in beta-testing now and is scheduled to be available later this year, is software that provides a centralized point for managing multiple virtual servers on heterogeneous systems. It includes technology called VMotion that the company says lets users move live, operating applications from one physical machine to another without disruption.

In the past, VMware customers had to turn off servers to move the virtual machines, which are basically software files that contain operating systems and applications.

That's one of the features that particularly appeals to one VMware customer who has used the company's virtualization software for about six months. The customer, a CTO at a large financial institution who asked not to be named, says he has avoided about $500,000 in hardware costs, while improving utilization rates on the servers he's running.

With Control Center and VMotion, which he will beta-test beginning in July, he expects even greater savings and performance enhancements.

"With VMotion technology I can do things in a way that I can have zero downtime for my users," he says. "The other thing is today I have to manage each box individually. [Control Center] is going to give me a multi-box view so I can have one console for all of my [virtual servers] in a single view. It's a big productivity booster."

He expects to be able to raise his server utilization rates to as much as 80% by using Control Center and VMotion to ensure that software needs are matched with hardware resources.

"I can carve out exactly what [resources] I need," he says. "Where virtualization plays a key role is when you need an individual machine, but you can't make the machine small enough. And there are lots of things that fit that mold."

Control Center lets users monitor virtual machine performance and availability and move virtual machines across servers to ensure they're being used as efficiently as possible. In addition, the package lets users set management rights that can be restricted based on a user's position within an organization.

Analysts say VMware is taking the next logical step with its technology that is designed to help companies consolidate their server infrastructures.

"Virtual machines are nice, but now I've got them all over the place and it's a manageability headache. Control Center makes it much more realistic to run a bunch of virtual servers," says Frank Gillett, an analyst with Forrester Research.

VMotion is also significant, he says, because although it might take a while for customers to get comfortable with the idea of moving virtual machines, it will let them put more critical applications on VMware servers.

"Because you know that if the hardware gets into trouble or if you need to scale up the capabilities [of] that particular virtual machine, you can move it to bigger hardware in a hurry," he says.

VMware competes with companies such as Connectix, which Microsoft acquired earlier this year. With Control Center, it will begin to compete in the management arena with companies such as Leostream, which makes software to centrally manage virtual machines from VMware and Microsoft.

Pricing for VMotion and Control Center have not yet been released. ■

Ethernet

continued from page 15

What analysts consider the low-end, or commodity, segment, of the Ethernet LAN market is where some of the fiercest battles are going on. In terms of Layer 2 fixed-configured products, Cisco accounted for about one-third of the 131 million ports shipped in 2002, according to Gartner. Hot on Cisco's heels was 3Com, with 13%, followed by small office/home office switch makers D-Link Systems and Netgear, with 11% and 9%, respectively.

"Because the equipment is becoming so standardized on the low end, it's a new kind of competitor that's gaining market share," Ahlawat says. This trend is driven by small and midsize businesses that are looking for lower prices and willing to build networks out of heterogeneous gear.

In the high-end enterprise backbone market, which analysts define as Layer 3 modular LAN gear, Cisco's hold on the arena in terms of revenue and shipments is stronger. The company had 74% of the $4.5 billion market in 2002, according to Synergy Research Group, and 64% of the 11 million ports shipped.

Cisco has long been considered among the leaders in switching, but it has pulled away from its competitors over the last two years, growing its share by more than 20% in modular Layer 3 shipments and sales since 2000. Two years ago, Enterasys Networks had 22% of the LAN Layer 3 core market, while Nortel had 12% and Extreme Networks had 10%. Now those companies are all in the single digits.

Ahlawat says Cisco's success in the Layer 3 enterprise core is due to its entrenched presence in large corporations, which are more likely to buy from Cisco because they are looking for an end-to-end network infrastructure, rather than point products for the LAN core.

While Cisco dominates most of the Layer 2 to Layer 3 market, more parity can be found in markets for advanced switching gear. According to Synergy, Cisco was the overall leader in Layer 4 to Layer 7 switch revenue in 2002. But in fixed-configured Layer 4 to Layer 7 gear — known as Web switches or load-balancing boxes — Cisco was behind Nortel, which had 40% of the $202 million market. Cisco's share was 28%, followed by F5 Networks, Radware and Foundry Networks, with 10% each.

Another market that gives an even more varied leadership picture is the emerging 10G Ethernet arena, where Synergy had Foundry as the leader with 50% of the $57 million in 10 Gigabit sales last year. Cisco was second with 41%, while Extreme, Nortel and Avaya followed with about 5% each.

Analysts say markets for these highly specialized products are still wide open because users of Web switching or 10 Gigabit are more likely to buy gear such as point products, instead of as part of a larger overall infrastructure rollout. ■

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Retailers spur supply chain registry

■ BY JOHN FONTANA

Mega-retailers Wal-Mart and The Home Depot have ignited an industry-wide effort to create a master catalog of retail product data targeted at slashing billions of dollars in supply chain costs and triggering a new generation of sophisticated e-commerce tools.

The two giants are members and advocates of UCCnet, a global registry of product data, such as item number, that lets retailers and their supplier partners build a master catalog of products they buy and sell. In essence, it is like a telephone directory for every product available and guarantees, for instance, that when a store orders a case of paper towels that is what it gets. UCCnet also is dynamic and if suppliers change any of the 151 possible attributes describing a product in UCCnet's GLOBALregistry, retailers are notified in near real time, eliminating many supply chain hiccups.

Companies today suffer through expensive errors in invoicing, purchase orders, product delivery and scanning accuracy because product data is obsolete or inaccurate.

UCCnet aims to change that by teaming two standards, the Global Trade Item Number, a globally unique product number, and the Global Location Number, which identifies shipping and receiving points.

The combination will not only streamline product data synchronization but also create a foundation for more significant e-commerce tools such as scan-based trading, where suppliers don't get paid until a product is scanned and purchased by a customer, and collaborative planning, forecasting and replenishment.

"Today we have many people matching paper, matching invoices, matching purchase orders, and all that goes away or the majority goes away," says Mark Healy, senior director of merchandising operations for The Home Depot. The company signed up late last month after nearly a yearlong evaluation process to ensure UCCnet could scale and was secure. "UCCnet is the root of everything we need to do to make our stores run more efficiently," Healy says.

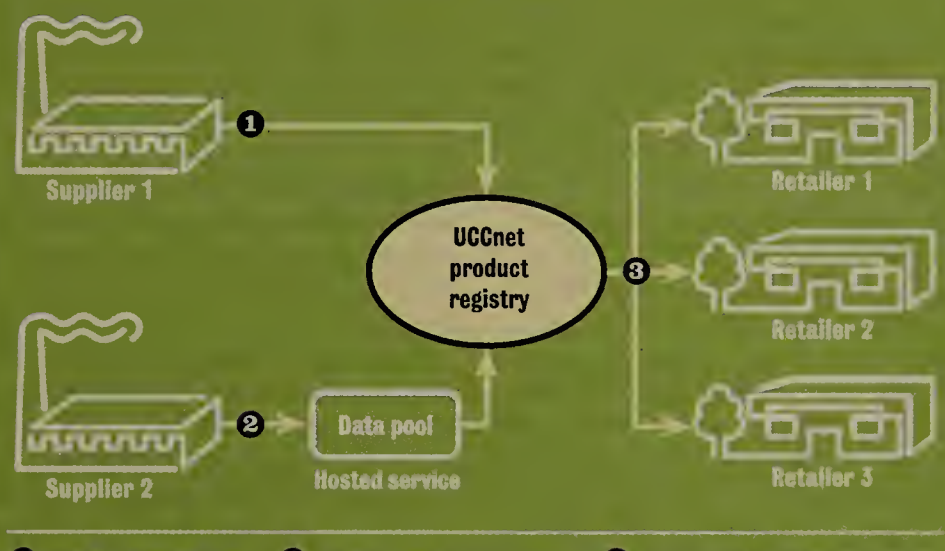
That efficiency means more accuracy between a retailer's order and what the supplier delivers; reduction in stock shortfalls in retail outlets; and greater efficiencies throughout the supply chain from distribution, warehousing, store operation, merchandising, shelf and space management, and accounting.

Healy says The Home Depot lost

See UCCnet, page 20

Retail boost

UCCnet is trying to create a global registry of product data so retailers and suppliers will have a synchronized set of information that will help smooth problems in the supply chain that cost the industry $40 billion in total sales per year.



1 Supplier 1 feeds XML-based product data to registry.
2 Supplier 2 uses hosted service to feed XML-based product data to registry.
3 Data and changes/additions to the date stored in the registry is synchronized to retailers in real time.

Short Takes

■ **Sybase,** a subsidiary of iAnywhere Solutions, has updated software designed to push e-mail out to wireless devices from enterprise servers, adding support for mail attachments. The **Pylon** family of software also can synchronize mail stored on a handheld device with that on a desktop PC or server. The Pylon Anywhere server component works with Microsoft's Exchange 5.5 and 2000, IBM's Lotus Notes 4.6 and 5.x, while versions for Exchange 2003 and Lotus Notes 6 should appear by early in the fourth quarter. The new version adds support for e-mail attachments — although the level of support depends on the wireless device used. Pricing for the products ranges from $75 for a copy of Pylon Conduit up to $299 for the server software.

■ Start-up **Reflectent** last week released Version 2.1 of its flagship desktop performance management software, **EdgeSight.** The software monitors desktops, laptops and other end-user devices for performance and availability. The company says it tracks application performance to determine, for example, the cause of a crash when a PC fails. EdgeSight 2.1 adds features that can monitor application usage on desktops as well.

The software runs on Windows servers and includes agents to run on managed Windows clients. The software also requires SQL database and Microsoft Internet Information Server. Network managers administer the software via a Web-based interface. The software costs between $50,000 and $75,000 for an average implementation.

LANDesk punches up patch management suite

■ BY DENISE DUBIE

Customers looking to automate the repetitive and tedious processes of updating security patches, rolling out new applications and simply managing desktops might want to consider LANDesk's offering due out later this year.

LANDesk last week announced patch management software designed to work with the company's LANDesk Management Suite, now in Version 7. LANDesk's Management Suite, which includes asset, inventory and configuration management applications, runs on Windows servers and clients. Network managers administer the patch features either through a Web browser or a Windows interface.

The patch management software can help customers automate vulnerability assessments, patch downloads and software distributions. With more than 4,000 known vulnerabilities and more cropping up daily, managing patches has become a burden on many IT staffs.

Denny Cannon, PC integration specialist at Farm Credit Services of America in Omaha, Neb., says he will deploy the patch management add-on, scheduled for general availability in October, to help alleviate the manual work involved in managing patches on his network. He says with a team of five staffers currently working with a manual risk assessment, he hopes the software will more quickly assess where he needs to apply patches and more effectively secure his network.

"It will help with keeping our systems up-to-date more efficiently, by automatically downloading the patches we need for the systems we specify," Cannon says.

With this product, the company says administrators will be able to configure LANDesk Management Suite to track patches for specific applications. The LANDesk Software security management product automatically will monitor

See Patch, page 20

'NET INSIDER
Scott Bradner

The usefulness of 'do not' signs

Many years after it became clear to most of the U.S. population that it needed to be done, a federal "do not call" list is almost here.

Those whose business model is predicated on interrupting your dinner are crying foul and have gone to court to try to stop the list from becoming operational. But finally the data-gathering phase has started, and, if the courts do not intervene, the number of unwanted calls will plummet Oct. 1.

The idea is simple: Let the people who have to answer a phone be able to say that they do not want to get calls on that phone from telemarketers. But simple is not how things turned out.

At least it is simple to register the phone numbers. Just go to www.donotcall.gov and follow the instructions. Seven million numbers were registered the first day the service was enabled in spite of severe server overloading.

My registrations went through in a few minutes early in the day but some people reported not being able to get through or long delays before they got the confirmation e-mail messages. The FCC estimates that up to 60 million phone numbers will be registered over the next year.

So what is wrong with this picture? Basically, "do not call" does not mean "do not call." It actually means: "most people, do not call." Politicians, opinion surveys and charities still will be able to call, as will companies that think they have a business relationship with you. I predict the last exception will be rather overexploited.

Note to politicians: When I say "do not call," I mean it. Any call to me will ensure I will not vote for you. Note to charities: A call will ensure I do not contribute. Note to businesses that think they have a business relationship with me: A call will ensure that you will not.

There is another side to the story. The Direct Marketing Association (DMA) says that the feds maintaining a do not call list is bad for me and might be unconstitutional. Because the DMA also maintains such a list (or at least claims to; I could not find it on the Web page www.the-dma.org), complaining about the federal one seems a bit of a stretch.

Reports in the press say that the telemarketing industry fears that the inability to get you out of the shower or up from dinner will devastate its business and will cause lots of people to lose their jobs. I have sympathy for the people who will be looking for new jobs, but the complaint rings a bit hollow. It is like someone hiring a bunch of people to urinate on the front doors of strangers and then threatening layoffs when the homeowners get permission to put up "do not urinate" signs. They also would complain that my being able to put up a "do not urinate" sign is a violation of their rights — I don't think so.

It is well past time for this service to be running, but better late than never.

Disclaimer: "Late" might have a different concept in a 367-year-old institution, but the above is my opinion, not Harvard's.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

UCCnet

continued from page 19

approximately 3.5% of its $58.2 billion in 2002 sales because of supply chain inefficiencies. Those numbers are in line with the entire retail industry, which loses $40 billion, or 3.5 %, of total sales each year to supply chain information problems, according to research firm A.T. Kearney. The research firm adds that 30% of items in retail catalogs have data errors, each costing between $60 and $80 to fix and consuming 25 minutes of manual correction.

The rewards of UCCnet's registry are becoming too big to ignore, and membership has risen 144% among suppliers and 100% among retailers in the past 12 months to a total of 670 members, according to Rhonda Horn, vice president of business development for UCCnet. Enrollment is growing at 60 members per month.

The Home Depot is requiring its 10,000 suppliers to join by year-end and implement the service by June 2004 or lose their relationship with 1,500 stores.

"Home Depot joining is close to the tipping point [for critical mass] for UCCnet," says Andrew White, an analyst with Gartner.

Ace Hardware is requiring its suppliers to comply by October and Lowe's target is the end of the year. Wal-Mart triggered the avalanche in January with a memo to suppliers stating the company would only accept item data electronically after January 2004.

"Once Wal-Mart joined up, we knew we were where we had to be," says Jim Goorhouse, director of IT for Novartis Consumer Health, which is using its Gerber baby food division as a test pilot for UCCnet.

Others funneling suppliers to UCCnet include Ahold USA, Food Lion, Shaw's Supermarkets, Supervalu, Albertsons, The Great A&P Company and Wegmans Food Markets.

The challenges

But the effort faces challenges. UCCnet is a public registry for synchronizing data that doesn't address all areas of complex, often private, transactions. Electronic data interchange also provided data synchronization, but it began to get expensive and complex when other data was traded electronically.

White says retailers and suppliers still must figure out how to exchange other information, including price and promotions. Interest in XML as a data-formatting technology likely will provide a boost.

In addition, UCCnet and registries in Canada, France, the U.K. and other countries have been talking for more than a year to no avail about integrating efforts. And there are questions as to whether the UCCnet model can be replicated across industries. Today UCCnet serves grocery, apparel and hardline (or home improvement) items. The automotive, chemical and high-tech industries are absent.

"Who knows what this looks like in five years, but it is safe to say that product data synchronization is here to stay," White says.

That is indeed true, industry observers agree. So retailers and suppliers face the task of cleaning up their product data internally and ensuring those systems can support electronic supply chain processes.

"Data cleanup requires considerable manual effort and resource from the business," says Nick White, vice president of information architecture at UCCnet member Unilever, which has 50 instances of SAP with incompatible product data. "It's not a task that can simply be given to IT. It requires definition of business rules, attribute normalization, recoding and [extraction/transformation/loading] and reconciling tools."

To aid in that task, Unilever is using software from Trigo Technologies called Product Center, which provides an authoritative source for product data that Unilever uses to update its enterprise system and feed the UCCnet registry. The system eventually will be used to support future adoption of radio frequency identification.

Companies such as Novartis are using data-pooling services such as ViaLink to clean up and publish data to UCCnet.

ViaLink charges between $1,500 and $100,000 to implement its service, including product data cleanup, and a $100 to $2,000 monthly service fee.

"ViaLink is certified with UCCnet and they manage the relationship," Novartis' Goorhouse says. "It was easier to go through them than to get certified ourselves."

ViaLink also helps to manage relationships with suppliers such as price and promotions.

"The big bang, the big benefit, will come when UCCnet figures out how to do that," Goorhouse says. "Salespeople can get creative with the deals they put together and that makes it hard to communicate those deals electronically."

Bridging that gap is part of UCCnet's plan, but for now the industry is excited by the process of putting product data into a single authoritative source.

"If you can't describe what a product is, you can't order it and you can't buy it," says Betsy Hill, director of marketing for ViaLink. "If you don't synchronize product data you can't do anything else because you can't trust the data." ■

Patch

continued from page 19

industry-standard vulnerability databases such as ICAT, Microsoft, Red Hat, Sun and SUS. When a new patch is detected, it will be retrieved automatically and packaged for automated, targeted distribution across the network.

LANDesk Management Suite consists of server software and distributed agents. The agents on managed devices collect data that will inform the patch-management application if they need to be patched or updated. The software also includes a rollback feature, which lets network managers de-install a patch if an error occurs and restore the machine to its last good state. The software also tests the patch before rolling it out across a company and then performs a follow-up audit to ensure the patch has been deployed properly, the company says.

"It will lessen the amount of time it takes now to evaluate and implement patches," Cannon adds.

As an add-on, the software works only with LANDesk's Management Suite, which competes with Altiris, Marimba, Microsoft and Novadigm.

Pricing for the LANDesk security management software will be determined when the product becomes generally available. LANDesk Management Suite 7 costs $79.95 per managed node. ■

Money pit

Business and government entities worldwide spend in excess of

$2 billion

annually to investigate, assess and deploy security patches and updates to desktops, servers, applications and network devices.

ServiceProviders

■ THE INTERNET ■ EXTRANETS ■ INTEREXCHANGES AND LOCAL CARRIERS
■ WIRELESS ■ REGULATORY AFFAIRS ■ CARRIER INFRASTRUCTURE DEVELOPMENTS

Short Takes

■ **Tellabs** recently announced completion of its $135 million **acquisition** of multiservice edge switch maker **Vivace Networks.** Concurrent with the deal's closing, Tellabs confirmed that NTT and MCI, formerly WorldCom, are using Vivace's switches.

The acquisition lets Tellabs expand into the global service provider edge router and switch market, estimated at $3 billion in 2003 and growing to $5 billion by 2005, according to Infonetics Research. Products obtained from the acquisition will form the Tellabs 8800 series switches: the 320G bit/sec Tellabs 8860, for large central offices; and the 16G bit/sec Tellabs 8820, for smaller central offices and POPs, customer premises and multitenant buildings.

■ **Qwest** has upgraded its dial-up Internet access service for business and wholesale customers to support faster connectivity and greater geographic reach. Qwest now supports the International Telecommunication Union's v.92 specification, which supports upstream transmission speeds up to 48K bit/sec, faster dial-up call completion between the user and carrier's network, and Internet call waiting.

The previous ITU specification, v.90, only supports upstream transmission speeds up to 33.6K bit/sec. Both standards support downstream transmission speeds at 56K bit/sec. Users can expect to reduce the amount of time it takes between when they click the connect button and when they surf the Web by 25%. And all users will be able to put their Internet connection on hold while they answer a voice call over the same line they use to connect to the Web.

Customers will have to use a v.92-compatible modem to take advantage of the new features. Qwest also is offering customers international dial-up support in 40 countries throughout Europe, South America and North America.

Verio takes the plunge on IPv6

■ BY DENISE PAPPALARDO

ISP Verio, a subsidiary of NTT, is rolling out IPv6 support to U.S. customers in a move the company says will offer more flexibility for current and future network needs.

The native-mode IPv6 service will let users that have upgraded to IPv6 internally take those capabilities to their WANs. IPv6 tunneling lets users maintain standard IPv4 WAN connectivity but test IPv6 addressing and support on small network segments, says Stan Barber, vice president of engineering operations for Verio's broadband business unit.

"It's not the zippiest service because it's riding inside IPv4, but it will have a good price-point that will let users put their toe in the water," Barber says.

IPv6 is the newest IETF IP specification. Although ratified in 2000, it has not been widely deployed by users or carriers in the U.S.

Benefits touted with IPv6 include the ability to support many more IP addresses and auto-configure addressing on a network.

IPv6 has a 128-bit address space compared with IPv4's 32-bit space, which exponentially increases the number of addresses an IPv6 network can support. IPv6 also eliminates the need to configure IP addresses on a network manually. This version of the protocol lets a host machine automatically configure IP addresses for all IPv6 devices on a network.

IPv6 has been part of the RFP process for carriers in Asia for a couple of years, says David Willis, an analyst at Meta Group. While Internet 2 and a number of U.S. carriers are testing IPv6, neither AT&T nor MCI, the two largest service providers domestically, has announced support.

"If the largest U.S. carriers haven't found a need for IPv6 it makes you wonder why Verio needs it," Willis says. While Verio, on its own, might also not need IPv6, it seems that the ISP is bringing its network up to speed with its parent's network.

"NTT is the largest carrier in the world," which might be why it has upgraded many of its Asian networks and also why it is upgrading its ancillary networks, Willis says. "If it streamlines operations and customer support then it's a positive move. But it's not a feature that users in the U.S. are asking for."

"IPv6 is in the early adopter phase," Verio's Barber acknowledges. "There has been higher resistance to IPv6 adoption in the U.S., but it's important to offer users the service to try out."

Native IPv6 service is available in San Francisco, Los Angeles and Washington, D.C., and IPv6 tunneling over standard IPv4 dedicated access service is available throughout the country.

NTT offers IPv6 services in Australia, France, Germany, Great Britain, Hong Kong, Japan, Korea, Malaysia, the Netherlands, Spain and Taiwan. The company says it has 500 IPv6 customers, but none in the U.S. that it would mention.

Verio would not elaborate on pricing, but says the tunneling service is "inexpensive, but not free."

The ISP says it will support native IPv6 throughout the U.S. by year-end and will determine its rollout plan based on customer interest. ■

More online!

Listen to audio primer and learn how IPv6 works as well as its benefits over the current IPv4 standard.

DocFinder: 6628

Juniper enhances edge offerings

'Service-Built' extensions intended to drive carrier revenue.

■ BY JIM DUFFY

Juniper Networks last week unveiled new and enhanced products designed to let service providers derive more revenue from the edge of their networks.

Under the umbrella "Service-Built Edge," Juniper rolled out an E-series edge router, an Ethernet services interface for its M-series routers, enhancements to its products' broadband aggregation capabilities, and virtual private LAN service (VPLS) and packet flow accounting software. The new and enhanced products are intended to make services at the edge more profitable by enabling tiered service offerings that will entice users to upgrade and to deliver a greater ROI, Juniper says.

"Every carrier is faced with driving top-line revenue," says Mark Bieberich, an analyst at The Yankee Group. "The edge is where services are defined and accountable. They need to implement the most reliable and scalable edge infrastructure possible."

Juniper says 20 of the top 25 service providers worldwide are "service building" their edge networks.

Juniper is the second-leading edge router company, behind Cisco. In broadband aggregation, Juniper is No. 1, with 52% of the $69 million worldwide market for the first quarter of this year, Gartner says.

Last week's announcements are intended to solidify and increase that lead. One weapon in that effort is the new edge router, which is called the ERX 310.

The ERX 310 is optimized for low-density service areas. It features three line-card slots and can use existing E-series router line cards for investment protection, Juniper says.

The ERX 310 supports 4,000 fractional T-1/E-1 circuits and up to 16,000 subscribers.

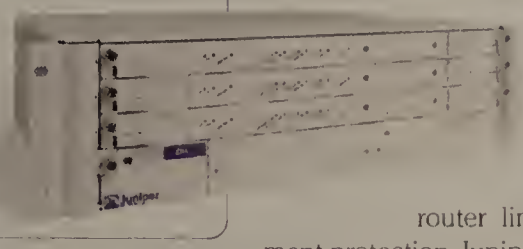
The Ethernet services interface, meanwhile, comes in single- and dual-port Gigabit Ethernet varieties. It uses Juniper's previously announced Q Performance processor for enhanced quality of service, and supports per virtual LAN quality of service and packet accounting.

See Juniper, page 22

On edge

Juniper's new ERX 310 router plays a key role in "service building" the edge.

- Designed for low-density sites.
- Uses Juniper's Q Performance QoS processor.
- Supports 4,000 fractional T-1/E-1s in three slots.
- Serves 16,000 subscribers.



EYE ON THE CARRIERS
Johna Till Johnson

How to get real answers from service providers

Periodically I get the question "What service provider should I go with?" Or, as a reader recently put it, "I hope you write a column about how to evaluate telcos using the resources out there on the 'Net, but I'll have signed a multi-year contract by then."

Let's make it now then. While the information is typically not posted conveniently on the 'Net, a structured selection process can generate a ton of useful information that will help you make informed decisions, at no extra charge. Here are some tips for obtaining the right information about your service providers:

- Create an RFP that includes your voice, data, wireless, Internet, remote-access and hosting needs. You might not elect to outsource all of the above or to procure all those services from the same provider, but including them in the RFP helps find out what services are available from the providers. Ask them to explain their offerings to you — and don't hesitate to play one off against the other.
- Ask for reference customers. (Also ask for names and numbers of customers who elected not to go with the service provider you're seeking, though those might be harder to get.) Call the references and interview them about their experiences with carriers other than the folks who provided them as a reference. In other words, ask AT&T customers who switched from Sprint to provide details on what went wrong with their Sprint relationship.
- Plan a dog-and-pony show for each serious contender. Invite them to your offices to answer questions from you and your team. Specify that the sales executives must be accompanied by representatives from engineering and customer service so you get the real answers.
- War-game in advance. Before the dog-and-pony shows begin, invest the time to hold a brainstorming session with your team to find out what scenarios are likely to pose challenges to you (for example, a catastrophic outage of three T-1s leading into your company's headquarters). When the providers arrive, ask: "How would your company handle that scenario?" Then listen to the answers, but ask the telco to provide names and contact information for customers for whom they've handled similar problems. If they can't, your antennae should go up.
- Verify financial stability. Borrow some people from your company's CFO's office and ask them to prepare an up-to-date financial analysis of the telcos you're considering. Look at debt, profitability, cash flow, recent mergers and acquisitions, and market performance. Make sure the financial types brief you and your team in advance of the provider dog-and-pony shows. Ask the financial folks to be present at the shows, and encourage them to ask questions.

The upshot is that getting up-to-date information from customers, competitors and other departments within your company is the best way to find out the "dirty little secrets" a service provider doesn't want you to know.

Till Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.

Juniper

continued from page 21

The broadband aggregation enhancements include secure remote access via IP Security; support for IPv6; and the ability to accommodate up to 48,000 subscribers per router without having to disable any services.

The VPLS software is based on Multi-protocol Label Switching's Kompella draft for Layer 2 integration with an IP/MPLS core. It is designed to provide multipoint-to-multipoint Ethernet services between metropolitan areas.

The VPLS software supports autodiscovery of nodes and routes, and inter-autonomous system capabilities so large carriers can interwork their networks and with those of their partners.

The packet-flow accounting capability is called J-flow and helps align billing with actual network resource consumption through sampling and stateful monitoring of up to one million flows.

J-flow also can be used for network planning purposes, and operates independent of the data path. It augments the existing per byte/service/subscriber/interface accounting of Juniper's edge routers.

Juniper also says its SDX-300 Service Deployment System now includes an Application Admission Control module that lets service providers provide, and bill for, "assured" user experiences. The module's awareness of access network congestion points facilitates this assurance.

Bieberich says Juniper's challenges in this market are the same for all players: gain more market share, stave off incursions from competitors, and continually improve the scalability and reliability of its products.

"Carriers are telling them that," he says. "You'll see quite a bit of [research and development] and improvement from all vendors over the next couple of years."

Most of the enhancements are included in new JUNOS software version upgrades, so there's no charge for those for existing users.

The ERX 310 costs $25,000. Pricing for the Ethernet services interface card starts at $30,000. ■

10 GIGABIT ETHERNET FOUNDRY

Foundry is the 10-Gigabit Ethernet leader. We were first in the market in October 2001, and we continue to dominate 10GbE market share. Why? Because we offer a complete high performance solution from wiring closet, server farm, to backbone. Our solutions are easy to deploy, and future proof: our modular switches are 10GbE ready without a forklift upgrade. They're comprehensive: supporting standard-based replaceable 10GbE optics with distance up to 40 km. They add value beyond bandwidth: our JetScope ™ sFlow technology allows you to monitor network traffic, on every port, without performance degradations. And they are proven in real-world networks: University of Southern California, Walter Reed U.S. Army Medical Center, London and Amsterdam Internet Exchanges, as well as NTT/Verio. Want to experience 10-Gigabit Ethernet? Follow the leader. Contact Foundry today at 1.888.TURBOLAN or www.foundrynetworks.com/10GbE

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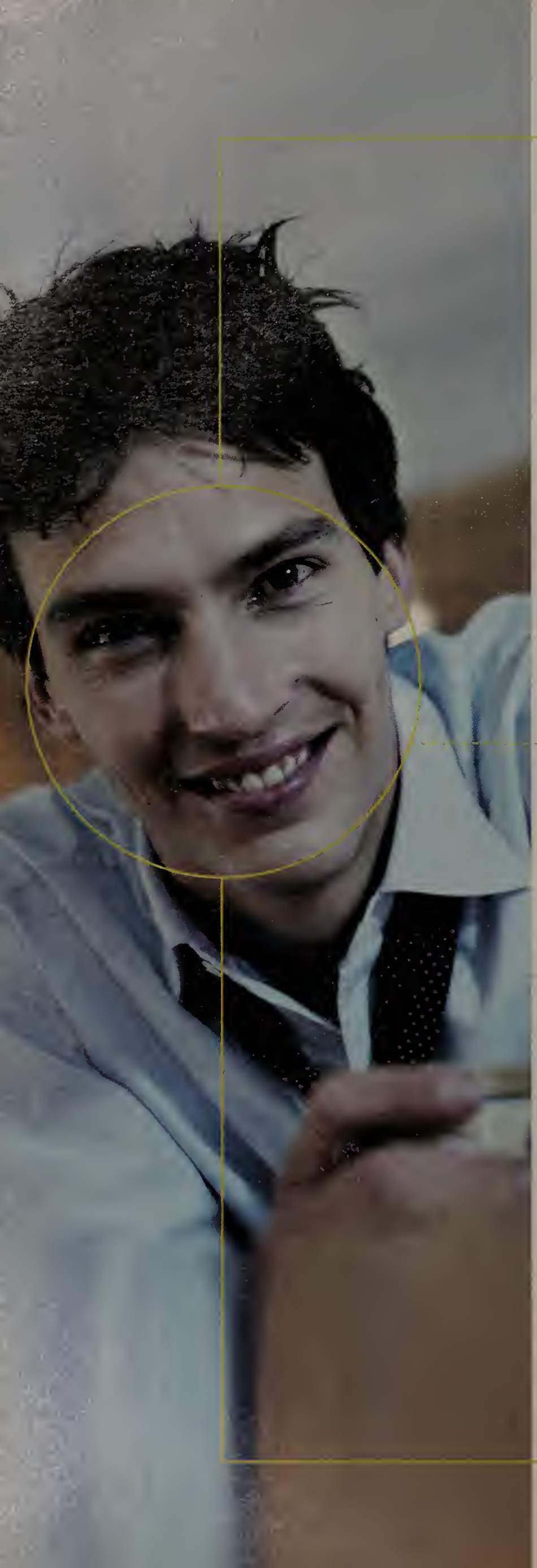

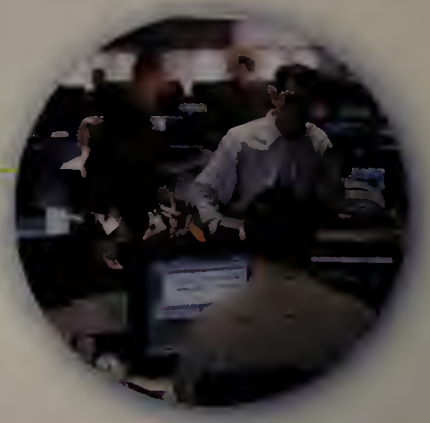

Real security means having all the right tools.

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■ PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

Biz technology system still rough

■ BY JAMES GASKIN, NETWORK WORLD GLOBAL TEST ALLIANCE

NetworkWorld Review

EmergeCore Networks' IT-100 promises small-business owners a complete business-technology system — Web hosting, e-mail services, file sharing, firewall and built-in wireless access point and router — so easy to set up and manage that they won't need IT help. And the price is right: At $1,395, the hardware and software system costs less than comparable software servers from Microsoft and Novell.

But its good features — fast performance; quiet, fanless operation; and Web-building tools — barely balance out the underdeveloped and shallow management features, poor documentation and help screens, and convoluted administration.

EmergeCore says you don't need Microsoft Exchange Server, which saves $1,500. But the capabilities of POP3 and Internet Message Access Protocol mail server don't integrate with Outlook's calendars, task lists and address books. In a world of file and print sharing, the IT-100 doesn't include software to support its printer port. EmergeCore estimates $1,700 in systems-management cost savings, but it's hard to imagine the little management available would be worth that much. Backups through the included USB ports don't copy data or Web pages, only the system configuration files. An EmergeCore support tech admitted that it's not really a backup.

The 14-page Express Setup Guide echoes the installation screens, adds nothing else, and ends before explaining how to add users and mailboxes. An on-screen question-mark icon promises online help, but provides scant explanation below each option. There are no details about your choices or guidelines for making them.

The IT-100 builds domains for both the Internet services (Web and e-mail) and local file-sharing access via Windows network protocols. Defining users requires four screens to do what could be done on one or two. You create users through the Domain menu heading rather than the Users heading. But the Users heading controls only administrators. You can connect the IT-100 directly to your WAN (via cable or DSL modem) or to an existing router. When we connected the box to our cable modem, the IT-100 grabbed the network information correctly and automatically initiated network address translation (NAT) to support internal network addresses. This was the first installation step that delivered on EmergeCore's promised ease of use.

The server administration screen shows an excellent summary of WAN, LAN and wireless traffic reports, and data such as CPU load and disk space. From the summary page you can reach some, but not all, system configuration screens; the rest are reached via a menu. The IT-100 also automatically created individual user home directories, a nice touch. The "public" file area, accessible to anyone, is a common feature. Uncommon was the inability to set file access rights, either by user or directory.

The IT-100 includes NAT, a firewall, proxy services, and VPN client and server support. Firewall settings consist of off, low, medium and high. That's it for options, except for a denial list to block entire IP address ranges. The box also includes VPN client and server support geared to remote offices. A small business might find this adequate, but larger firms deploying the box in remote offices will want more control.

The IT-100 can be configured as a proxy server. Although there's no mention of caching support in the manual, the box caches Web pages. The Dynamic Host Configuration Protocol server intelligently separated wired and wireless address pools, and upgrades are a one-click affair. The SpamCop filtering service can be enabled or disabled for the entire e-mail system, but not for individual users.

One can argue the wisdom of putting a public Web site on an internal file server. But at least EmergeCore gives users a good head start on building brochure-ware sites. There are 60 site templates, including stock photos and marketing verbiage for 28 vertical industries.

The components snap together easily. A few include Flash coding that scrolls company name and information across the screen. Customized data, such as the company name, address and years established, weave in and out of the pre-written page content.

However, the directory of site files is hidden, forcing us to use the provided HTML page editor. Adding pages and images was poorly explained. Help pages exist, except for the ones with placeholders that said "help goes here." The HTML editor doesn't work with a Netscape 7 browser, although all the other management tools did.

EmergeCore IT-100's performance is strong, and the administrative browser-based tools are attractive and well done. But it doesn't drill down enough. An Advanced button on every administrative page that provided more management-control levels would make all the difference.

Gaskin is a Dallas-area consultant and author who has been helping small and midsize businesses use technology since 1986. He can be reached at readers@gaskin.com.

IT-100 features

Processor: Transmeta Crusoe TM5600, 533-MHz
System memory: 128M bytes SDRAM
Storage: 2.5-inch IDE HDDD, 20G bytes
Networking: Four-port switch with 10/100 M bit/sec Ethernet; one WAN uplink 10/100 Ethernet; 802.11b wireless access point
Operating system: CoreVista (heavily modified Slackware Linux distribution)

Files, fast

The IT-100 beats competitors in file performance.
For this test we transferred a 340M-byte WAV file via FTP to each of the three servers.

Unit	Transfer time
EmergeCore IT-100	41 seconds
Snap Server 1100	55 seconds
NetWare 6 on a Compaq ML330, 1-GHz Pentium III, 9.1G-byte SCSI disk	97 seconds

Short Takes

■ **Microsoft** last week announced the latest beta release of its **Small Business Server 2003.** To make client/server networks less intimidating to non-technical users, Microsoft made the user interface friendly and Windows XP-like; set up and configuration rely on wizards and default configuration settings. Management is eased, and the value of features such as system reporting and monitoring is more apparent, the company says. New is a data back-up and restore feature and the inclusion of Microsoft's SharePoint Services for intranet creation. Remote access features include the ability for users to access corporate desktops or Outlook only. Users with handheld devices running Pocket PC Phone Edition 2003 and Smart Phone 2003 can access e-mail, calendar and tasks. It is expected to ship this fall in two versions; the higher-end version will cost $1,499; pricing for the lower-end version has not been announced.

■ **HP** recently announced it will bundle a trial version of interMute's **SpamSubtract Pro** product on new HP Pavilion and Compaq Presario PCs. SpamSubtract Pro acts like a spam firewall, using a specialized algorithm and database of spam e-mail identifiers. Incoming e-mail messages are sorted into folders for confirmed spam, suspected spam and friendly messages. The product also can mask offensive words in spam e-mail messages and prevent previewing of image attachments. After a 30-day test period, the software costs $30.

Net Results

EmergeCore IT-100 — OVERALL RATING **3.05**

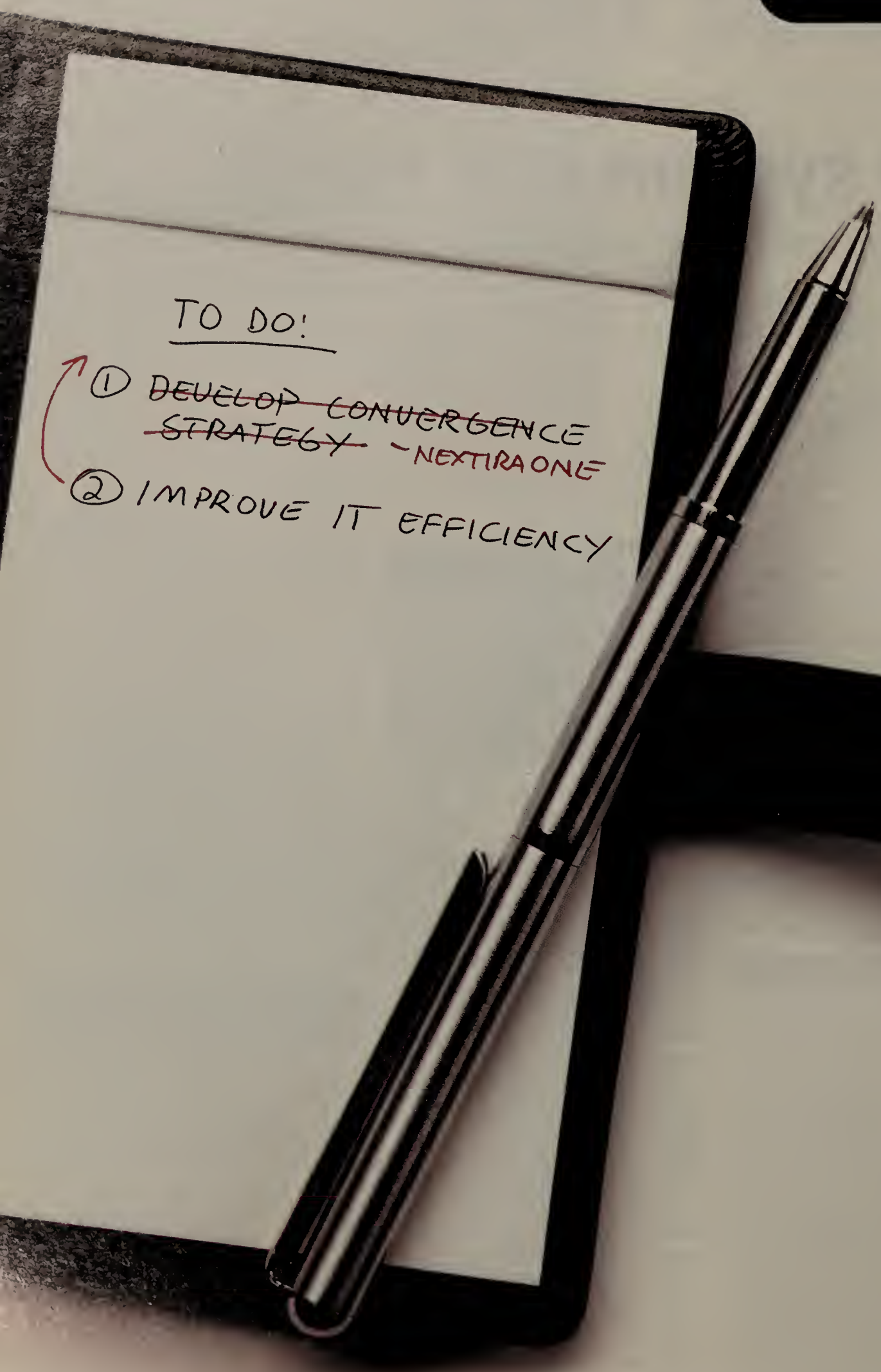
Company: EmergeCore Networks, (208) 947-8555 **Cost:** $1,395. **Pros:** Fast file performance, quiet, good bundle of DHCP, NAT and firewall. **Cons:** Superficial management, no troubleshooting tools or printer support, few security-configuration options.

The breakdown

Manageability	25%	3
Features	25%	4
Setup/installation	20%	3
Documentation	20%	2
Reporting tools	10%	3
TOTAL SCORE		3.05

■ **Scoring key:** 5: Exceptional; 4: Very good; 3: Average; 2: Below average; 1: Consistently subpar

nextiraOne



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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

TCP Offload Engine speeds processing

■ BY JOE GERVAIS

TCP/IP has long been the common language for network traffic, and recent initiatives such as Internet SCSI and Remote Direct Memory Access are making it the protocol of choice for storage and clustering.

However, processing TCP/IP traffic requires significant server resources. Specialized software and integrated hardware known as TCP Offload Engine (TOE) technology eliminates server-processing constraints.

TOE technology consists of software extensions to existing TCP/IP stacks that enable the use of hardware data planes implemented on specialized TOE network interface cards (TNIC).

This hardware/software combination lets operating systems offload all TCP/IP traffic to the specialized hardware on the TNIC, leaving TCP/IP control decisions on the server. Most operating system vendors prefer this approach, which is based on a data-path offload architecture.

NICs today process TCP/IP operations in software, which creates substantial system overhead. The three areas that cause the most system overhead are data copies, protocol processing and interrupt processing.

The explosion of the number of packet transactions generated per application network I/O causes high interrupt load on servers. Hardware interrupt lines are activated to provide event notification.

For example, a typical 64K bit/sec application write to a network results in 60 or more interrupt-generating events between the system and a generic NIC to segment the data into Ethernet packets and process the incoming acknowledgements. This creates significant protocol-processing overhead and high interrupt rates. While some operating system features such as interrupt aggregation can reduce interrupts, the corresponding event processing for each server-to-NIC transaction is not eliminated.

A TNIC dramatically reduces the network transaction load on the system by changing the system transaction model from one event per Ethernet packet to one event per application network I/O. The 64K bit/sec application write becomes one data-path offload event, moving all packet processing to the TNIC and eliminating interrupt load from the host. A TNIC provides maximum benefit when each application network I/O translates to multiple packets on the wire, which is a common traffic pattern.

Standard NICs incorporate hardware checksum support and software enhancements to eliminate transmit-data copies, but can't eliminate receive-data copies that consume significant processor cycles. A NIC must buffer received packets on the system so the packets can be processed and corresponding data coupled with a TCP connection. Next, the receiving system must associate the unsolicited TCP data with the appropriate application and copy the data from system buffers to the destination memory location.

Because a TNIC performs protocol processing locally before placing data on a system, it can use zero-copy algorithms to place data directly in application buffers, avoiding intermediate host-side buffering and the associated expensive receive-data copies.

TNICs dramatically reduce system overhead associated with moving data. Recent benchmarks have shown that replacing a NIC with a TNIC delivers the equivalent of double the number of processors in file servers and systems with heavy content-delivery demands. For footprint and power-conscious systems, TNICs use a fraction of the power of a corresponding NIC and microprocessor for the task of filling Gigabit Ethernet pipes.

TOE analysis tools are available to help administrators evaluate systems benefits in transitioning from the NIC I/O model to the TNIC I/O model.

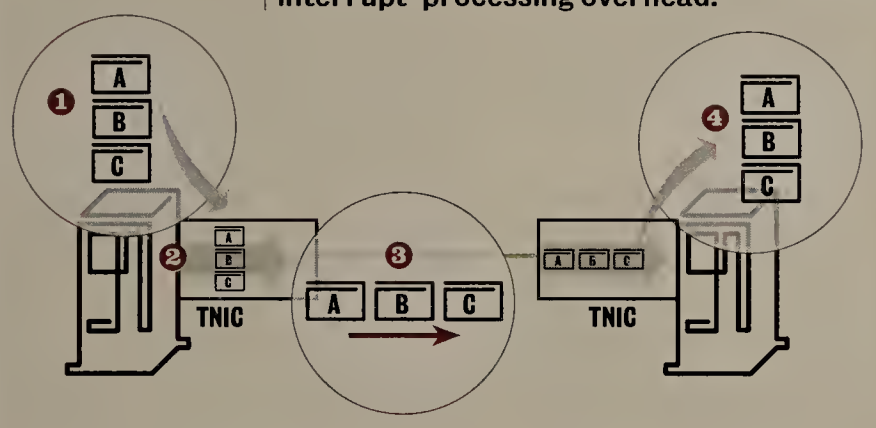
IT managers are deploying TNICs to provide servers with the necessary hardware processing to handle increasing data delivery demands. As TNIC functionality is integrated into blade servers, embedded systems and eventually desktop machines, OEMs and end users will benefit from the efficiency of TNICs in offloading all TCP-based networking and storage protocols "all TCP-based traffic."

Gervais is the director of product marketing at Alacritech. He can be reached at joeg@alacritech.com.

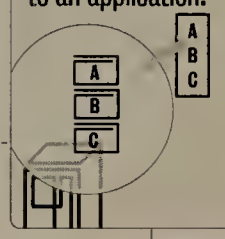
■ HOW IT WORKS

TCP Offload Engine

A TOE NIC (TNIC) provides efficient data delivery by eliminating data copies and protocol-processing and interrupt-processing overhead.



Traditionally, a NIC would buffer packets in host memory then the host TCP stack would reassemble the datastream and copy to an application.



1. Server A sends data to Server B.
2. Host TCP stack passes data pointer to TNIC.
3. TNIC performs all TCP protocol processing and sends packets over the network.
4. TNIC receives packets, reassembles datastream and places it in application memory.

Ask Dr. Internet

By Steve Blass

Our Web sites run on Apache/mod_ssl servers hosted by our ISP. We want to authenticate Web site visitors by using personal digital certificates instead of a basic logon dialog box. Can we configure Apache to require client certificates at the directory level? Can the site then use digital IDs issued by certificate authorities such as RSA Security and Thawte, or do we have to issue personal certificates to our users from our site?

Although performance is better when you place the authentication directives in the server's main configuration file, Apache with mod_ssl can be configured to look for personal digital certificates at the directory level. The same AuthConfig override privileges apply to both, so you should be able to require client certificates if you can make basic logon authentication changes on the server. Edit your htaccess file to include the following: SSLRequireSSL; SSLVerifyClient require; and SSLVerifyDepth 10.

This tells Apache to drop non-SSL connections and request client certificates for authenticating SSL requests below the protected directory. Web site visitors can use personal certificates issued by any certificate authority trusted by your Web server.

Blass is a network architect at Change@Work in Houston. He can be reached at drinternet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE

Mark Gibbs

KVM in, Linux server up, we install the WLAN

Last week we asked if anyone had any ideas on how to get Serial Advanced Technology Attachment drives to work under Linux, and Mark Mills was the first to respond: "Install a 3Ware card. I'm new to Linux but 3Ware's documentation made it fairly straightforward (even for a Windows user). If you are already familiar with Linux it will be a snap!" Mills went on to note: "64bit PCI slot + 3Ware Serial ATA controller = 185M byte/sec reads and 70M byte/sec writes in RAID 5."

He also boasted: "My most recent accomplishment — 12 individual 250G byte Serial ATA drives on one Serial ATA RAID controller for a total of 2.25 terabytes ... (put into RAID 5 comes to 2 terabytes of space) on a 5U server with 2 gigabit NICs, floppy, DVD-ROM, tape drive and N+1 redundant power supply." Cool. We detect a kindred spirit.

Armed with this information we are planning to put together a RAID Serial ATA configuration, so we'll let you know what we find out about the intricacies therein.

Anyway, we started off this series of Gearhead columns discussing the wireless LAN (WLAN) we set up for Jim Sterne's recent Emetrics Summit (see www.nwfusion.com, DocFinder: 6629). We're getting into this in a roundabout kind of way and so far have covered the setup of our Raritan keyboard/video/mouse switch in our lab that reduced the amount of running around we have to do, and last week moved on to an overview of what's new in the Red Hat Linux 9 software we loaded on our network server.

We were going to get into a detailed what's what in this Linux release but we found an exhaustive summary at Guru Labs (details at DocFinder: 6630) that tells you all you need to know and then some. Our experiences with Red Hat Linux 9 have so far been fantastic! It is fast, clean and it is a pleasure to play, er, work with.

So, now that the basic server was out of the way, we were ready to tackle the wireless network. Linksys loaned us a Dual-Band Wireless A+G Broadband Router (Model WRT55AG; see DocFinder: 6631), which is a WAN/LAN router, a four-port 10/100M bit/sec Ethernet switch and a wireless access point. The latter supports what Linksys calls Universal Wireless Access, which is to say it handles 802.11a, 802.11b and 802.11g.

Note that the ports on the WRT55AG's Ethernet switch support Auto-MDI/MDI-X. The specifications for 10Base-T and 100Base-TX define that two pairs of wires are used to connect two nodes. To do so the transmit side of the interface on one machine must be connected to the receive side of the other machine's interface and vice versa.

This requires that the wires in the cable used to connect the nodes be "crossed." Now, the design of standard unshielded twisted pair cabling with RJ-45 connectors uses straight-through wiring so the jacks on hubs have ports physically configured to be crossed over. Thus, NIC cards normally are configured to be "straight" (called a Medium Dependent Interface, or MDI), while hubs are normally configured as "crossed" (called a Medium Dependent Interface-Crossed, or MDI-X). So, if you need to connect a NIC directly to another NIC or hub to another hub, you'll need a cross-over cable.

Many hubs have a special port that lets you connect the hub to another hub's MDI-X port without using a cross-over cable. This port, configured as an MDI port, also is called an uplink port or MDI-II port.

The Auto-MDI/MDI-X feature automatically determines whether the port should act as an MDI or an MDI-X port.

Anyway, to support all three wireless communications standards the WRT55AG contains two wireless radios. One radio runs at 2.4 GHz for 802.11b and 802.11g service, providing 11M bit/sec and 54M bit/sec, respectively. The second radio runs at 5 GHz and supports 802.11a, which, like 802.11g, supports 54M bit/sec links. All this and the device is the same size as the company's previous access points.

Getting the WRT55AG running was a piece of cake. We configured it to provide Dynamic Host Configuration Protocol service but, because of the need for the WLAN to be open, we didn't enable Wired Equivalent Privacy.

We used a Linksys Dual Band Wireless A+G Notebook Adapter (WPC55AG, see DocFinder: 6632) to test the wireless out and — wow! — the performance of 802.11a and 802.11g is awesome.

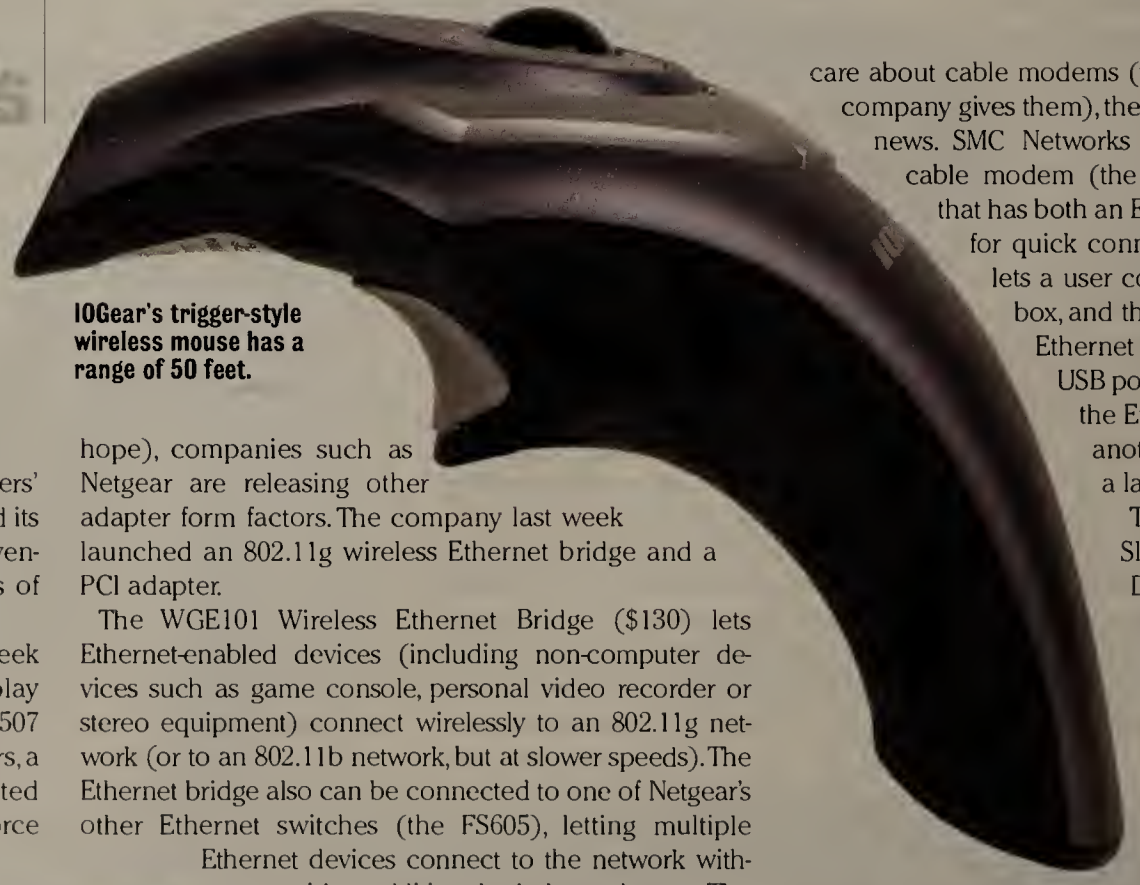
So, there was the infrastructure, next week, we fire her up!

Details, details, details to gearhead@gibbs.com.

CoolTools

Quick takes on high-tech toys

By Keith Shaw



IOGear's trigger-style wireless mouse has a range of 50 feet.

Another widescreen notebook

It looks like Apple hit another nerve with end users' tastes (I mean that in a good way). After Apple released its widescreen notebook earlier this year, PC notebook vendors followed suit with some widescreen notebooks of their own (HP announced one a few weeks ago).

The latest notebook is from Toshiba, which last week announced the Satellite P25-S507, a 17-inch-display widescreen (1,440 by 900 pixels) laptop. The P25-S507 includes built-in silver Harman Kardon stereo speakers, a built-in DVD-R/RW combination drive, integrated 802.11a/b wireless connectivity and an NVIDIA GeForce FX Go5200 graphics card.

The notebook includes an Intel Pentium 4 processor with hyperthreading technology, speeds up to 2.8 GHz, 512M bytes of RAM (upgradeable to 2G bytes), a 60G-byte hard drive, integrated 10/100M bit/sec Ethernet and V92 modem, and four USB 2.0 ports. The P25-S507 starts at about $2,100 and is available at Toshiba's Web site (www.shoptoshiba.com).

Toshiba has jumped on the widescreen bandwagon with its 17-inch model.

More wireless gear

As I wait for my USB-enabled 802.11g adapter (coming soon, I hope), companies such as Netgear are releasing other adapter form factors. The company last week launched an 802.11g wireless Ethernet bridge and a PCI adapter.

The WGE101 Wireless Ethernet Bridge ($130) lets Ethernet-enabled devices (including non-computer devices such as game console, personal video recorder or stereo equipment) connect wirelessly to an 802.11g network (or to an 802.11b network, but at slower speeds). The Ethernet bridge also can be connected to one of Netgear's other Ethernet switches (the FS605), letting multiple Ethernet devices connect to the network without requiring additional wireless adapters. The WG311 Wireless PCI Adapter ($90) installs on a desktop computer to give the computer access to an 802.11b or 802.11g network.

Both devices support 40-, 64- and 128-bit Wired Equivalent Privacy encryption, and the WG311 supports VPN pass-through and dynamic rate shifting, Netgear says.

SMC ships cable modem

While end users might not care about cable modems (they get whatever the cable company gives them), they might be interested in this news. SMC Networks recently launched a new cable modem (the EZ Connect SMC8004CM) that has both an Ethernet port and a USB port for quick connections. The cable modem lets a user connect his cable line to the box, and then connect a computer via Ethernet and a second one via the USB port. In addition, users can take the Ethernet port and connect to another hub or router to create a larger network.

The SMC8004CM is DOCSIS1.1-certified, but also has DOCSIS 2.0 capabilities built in, which means it will be "ready for the future," SMC says. The box is aimed mainly at cable broadband providers and will cost less than $50, SMC says. For more information, visit the SMC Web site.

Set your Phaser on 'Advance'

IOGear last week launched a new, trigger-style wireless mouse that includes an integrated laser pointer and a thumb-operated trackball. The $50 Phaser is aimed at PowerPoint users, who now can walk around a room and advance the next slide by pushing the Phaser's "trigger," which acts as the left-click function. The Phaser comes with a USB adapter that connects to a user's computer. The adapter connects wirelessly via radio frequency to the Phaser and has a range of about 50 feet, IOGear says. Go to the IOGear Web site for more details.

Shaw can be reached at kshaw@nww.com.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EDITORIAL

Bob Brown

Getting Vertical

So how about that RFID? Gotta love CPOE, right? Whaddya say about ETL? Just when you think you've got a handle on the latest network terms, along comes a new batch to send your brain whirling.

But don't feel too bad. The terms behind the acronyms above (radio frequency identification, computerized physician order entry and extraction, transfer and load) are more likely to be familiar to network IT executives in specific vertical markets than to network professionals in general. RFID is a huge trend in retail and manufacturing. With the Health Insurance Portability and Accountability Act somewhat under control, CPOE is a new focus for healthcare. And ETL is big for banks.

Our special "Getting Vertical" section in this issue (beginning on page 32) zeroes in on six markets — healthcare, education, retail, banking, manufacturing and state government — and highlights the hottest issues. While we examine many industry-specific technology advances in these stories, one thing that comes across is that plenty of challenges cut across industries.

Take security, for instance.

Our piece on the education market, "Security Lessons," explores the complex network issues schools face today. On one hand, they want to provide open access to information — the lifeblood of any school. On the other, they don't want to become easy marks for network intruders.

Security is foremost on the minds of network professionals at financial firms, too. "We have to apply patches nearly every day," the IT manager for one credit union tells us, referring to his network security battles.

Wireless is another topic that cropped up again and again. Healthcare officials, like those quoted in our story "Take two tablet PCs and call me in the morning," are salivating over the potential benefits for doctors and patients, but also have concerns about security and workflow. Wireless also is finding a home on factory floors, where wires really can get in the way (see "Shop talk," page 36).

Another common topic is doing more with less. That's the focus of our story on state government, where innovative projects are moving ahead despite shrinking budgets ("Shoestring networks," page 43). Money issues also are a big factor in how fast retailers go forward with RFID ("Playing tag," page 41).

No single vertical market segment accounts for more than 12% of *Network World's* readership (government/military represents the biggest chunk, followed by manufacturing). So we do tend to write most of our stories with a more general audience in mind. But enjoy these more focused pieces. After all, where else are you going to learn the difference between EMR and ePC?

— Bob Brown
Executive editor, news
bbrown@nww.com

opinions!

Power line problem

Your story "Broadband over power lines closer to reality" (www.nwfusion.com, DocFinder: 6622) minimizes the very serious "environmental" impact of power line communication/broadband over power line Internet service: radio frequency interference with many licensed and passive radio services. Amateur radio, public service radio, short-wave broadcasting and radioastronomy likely will suffer considerably because the power lines are inefficient at transmitting radio signals (see http://arrl.org/bpl). Your story indicates these issues have been addressed, but from my standpoint as a radio astronomer, ham operator and IT director, the "fixes" have been more on the political side than the technical.

Martin Ewing
Visiting fellow, Department of Electrical Engineering
Yale University
New Haven, Conn.

Dirty little secret

Regarding the Q&A with Novartis Director of Telecommunications Marc Shipman (DocFinder: 6623): I had to chuckle at the three new "applications" Novartis uses on its IP phones. Considering a PC is probably sitting right next to the phone, I'd much rather use a normal keyboard to type someone's name into the phone directory or to get the time or weather somewhere in the world.

I was glad to see Shipman tell the "dirty little secret" that most voice-over-IP vendors don't want you to know: It's not easy to integrate VoIP into your existing data and telecom infrastructure, and the vendors aren't always the best people to do the work.

Debbie Joy
Phoenix

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

Cashing in on MPLS

Regarding your story "Carriers struggling to cash in on MPLS" (DocFinder: 6624): My experience in working with the big interexchange carriers and regional Bell operating companies is they just don't do a good job positioning Multi-protocol Label Switching.

Last month I had a client that wanted to trial VoIP in 10 locations. It has a 40-node frame relay network with one of the domestic IXCs. I put an RFP together and sent it to all the IXCs and one of the RBOCs.

AT&T led with its MPLS product, IP-Enabled Frame Relay. Sprint pushed SprintLink. MCI pushed The Advantage, its Session Initiation Protocol (SIP) phone/MPLS bundle. My RFP stated that we wanted to use Differentiated Services to prioritize the SIP traffic. None of the responses mentioned Diff-Serv.

AT&T positioned MPLS as way to save money over frame relay — fewer permanent virtual circuits needed — but the starting price for the enterprise PVCs was twice the price of standard frame PVCs, so the savings was nil. Sprint's SprintLink was the cheapest by far, but didn't handle SIP prioritization. MCI's Advantage was too expensive given the SIP phones were in the bundle. My client wants to use Windows XP's SIP client.

When I pushed AT&T for Diff-Serv support, it told me to order two PVCs per location — one for voice, the other for data. Why are they pushing a network that is supposed to prioritize Layer 3 traffic, and then when a customer wants that, they propose an over-engineered solution to cover their behinds?

Next time, I'll tell a customer to forget about trying to get a carrier to take ownership of Layer 3 prioritization. I see a huge opportunity there, but the carriers have too much at stake in terms of their existing voice business trying to stifle customer adoption of VoIP.

Kevin Carman
Managing partner
Canard Partners
Atlanta

More online! www.nwfusion.com Find out what readers are saying about these and other topics. **DocFinder: 6621**

STAYING CONNECTED

Edward Horrell

No one here but the sales department

Call your own customer service departments and listen to what your customers are hearing.

A recent story in *USA Today* discussed the difficulty of getting assistance when experiencing service troubles. The writer gave examples of some national companies at which it is difficult, if not impossible, to get a live person to help you.

This inspired me to make a list of the important products and services I use at work and home. These include my local telephone service, long-distance (AT&T), wireless provider, PC hardware and software support, broadband Internet service, banking and utilities. I then expanded the list to include my doctor, local hospital, hair salon (are there any barbers left?), attorney, CPA and dentist. Next, I called the customer service number or main number for each to see how long it took to get "real-person" assistance.

The only companies at which live operators answered were my dentist and attorney, neither of whom I particularly enjoy talking to. AT&T and the hair salon never even allowed me to talk to the auto attendant (busy signals). My long-distance provider's loop of options included one for speaking with a customer service representative. When I opted for that, the loop began all over again. I waited 30 minutes to speak to a live rep from my cable company. And I concluded that there is no such company as Microsoft.

This exercise left me with these conclusions:

- I will buy a new PC before I call for hardware assistance. Messrs. Hewlett and Packard have obviously left the building.
- Buy stock now in AT&T. They have a deal for $4.95 and then 7 cents a minute for long-distance. That deal in itself is not so good, but the reason it makes sense as an investor is that once a customer is on it, he can't leave! I've tried for months to call the number on my phone bill to change my plan, but every time I call, I wait on hold about 30 minutes, figure it's cheaper to pay the $4.95 and hang up.
- Many of the employees at my hair salon seem to do nothing but look at themselves in the mirror all day. Why can't they put a mirror by the main phone so some of these folks can answer calls while they primp instead of having the customer listen to a recording to set an appointment?
- My local hospital's recording told me to call another number if this were an emergency. Thanks. (In the phone directory, they also list the number for their barbershop before their main telephone number…I might try them out.)
- If anyone can find a Microsoft number, please let me know.

By the way, try to connect to the sales department for any of these firms and notice how quickly you'll get through.

I am closing with a plea for corporate managers to call your own customer service departments and listen to what your customers are hearing. For most of you, this will take some time — be patient.

Horrell is a telecom speaker, author and consultant in Memphis. He can be reached at www.edhorrell.com.

YANKEE INGENUITY

Howard Anderson

Where's the war dividend?

I would love to offer my services for the first product: new and improved Tang.

Every time the U.S. goes to war, there always seems to be a "peace dividend" — a commercial spinoff from the Department of Defense spending that flows to the private sector. Because we needed a better way to gauge where artillery shells would fall, the U.S. Army invested money in computer technology during World War II. The spinoff was the early Univac and IBM computers that primed the pump for the first generation of commercial computing.

Next came the Cold War. Out of this came Tang and embryonic networking. Vietnam produced the idea of fail-safe networks, which could withstand nuclear attack. Peace dividend: the Internet.

The U.S. government now has made enormous pronouncements about massive spending because of Sept. 11. With the communications sector in a long-term funk and the commercial market moribund, I want to back any company that might grab some of the supposed spending by producing a technology that might morph to a real market in the industrial sector. But where? Yes, certainly there is an interface between government short-term needs and industry's long-term needs, but is that security? Security is a hard sell in the industrial world because it really doesn't create opportunities; it just forestalls some potential problems. In short, security is an expense, not a revenue-driving technology.

One way to look at the world is in terms of Big Customers … and no single customer is as big as the U.S. government. In the world of IT spending, government accounts for 21% of all spending. I'd like to find out just where the government is spending in computing and networking now, and to find those technologies and companies that could "slipstream" into those applications that are cost-effective and tamper-proof. I'm not the only one with this idea; every company and every venture capitalist wants part of that government goodie bag.

The problem is that what the government says it is going to do and what it actually does are not the same thing. Will the government back up its broad pronouncements about the cybersecurity threat with hard dollars, or will it do as little as possible as loudly as possible here and put most of the money into physical security and knock cybersecurity down to fifth or sixth on its agenda?

I would like to see the money go into authorization/authentication, identity management, Web application security, and intrusion detection and prevention. Each area represents a problem for the U.S. government now and an area where companies could benefit on an ongoing basis.

For example, the Army wants to outfit 50,000 troops with a program called Objective Force Warrior with more gizmos than even Hasbro Toys could think up. All of which will require … batteries. Even today, the modern U.S. soldier goes into battle with 65 batteries on his person and his weapons. I have invested in a company called A123, which is working on the problem of more battery power and lighter weight. Other investors include Qualcomm and Motorola. If this technology could be developed, it would quickly find its way into cell phones, laptops and power tools.

Maybe I should look at this from the other direction. Maybe I should be evaluating what companies need and then just treat the U.S. government as a corporation that has been supersized. The cutting edge is the area of collaborative computing — where two or more organizations combine to solve a problem for a common set of customers. In this situation, you have to give some access to your network to your collaborative partners but build some level of accountability and control. If you make it too difficult, then you can solve the security problem — except you kill collaboration. If you make the system too easy to vault the walls, you expose your company and your company's partners to intrusion.

These are the areas into which I would love to invest money and areas where I'm certain the U.S. government must address first. I would like to offer my services for the first product: new and improved Tang.

Anderson is senior managing director of YankeeTek Ventures, a Cambridge, Mass., venture capital fund for early-stage technology companies. He can be reached at handerson@yankeetek.com.

GETTING
Vertical

A look at the most challenging network issues facing major industry sectors.

HEALTHCARE

Take two tablet PCs

Healthcare industry looks to boost patient care through electronic data entry and record keeping via portable wireless devices.

■ BY DENI CONNOR AND JENNIFER MEARS

For IT executives in large healthcare organizations, compliance with the Health Insurance Portability and Accountability Act is, surprisingly enough, last year's business. With HIPAA under control, IT executives are turning to a more pressing issue: how to improve patient care on a tight budget.

Jeff Pelot, CTO for 350-bed Denver Health (formerly known as Denver General), has an astounding 120 projects underway. "My biggest challenge is keeping up with what we are doing," he says. Pelot's priorities are creating Web-based access to imaged medical records, providing high-speed access to the medical records department so employees can work from home, and updating his Oracle server back end.

Denver Health has invested 8% to 9% of its budget in IT, which has become "a very strategic part of the organization," Pelot says. IDC says that most healthcare organizations only spend about 2% of their budgets on IT, while the average across other industries is about 5%.

Even though Pelot has a higher percentage of his company's budget allocated for IT than most healthcare providers in the U.S, he still can't implement everything he wants. A voice recognition project recently was delayed because of lack of funding.

Jocelyn Young, an analyst at IDC, says that healthcare organizations tend to invest in areas that will help their mission, which is providing patient care. And technology is one of the key enablers of improved healthcare, she adds.

A Modern Healthcare study conducted by PricewaterhouseCoopers and R. Marreal and Associates reinforces this. It concludes that improving patient-care capabilities through IT is the No. 1 priority of 63% of the CEOs, CFOs and CIOs who responded.

In *Network World* interviews with more than 20 IT executives in healthcare, the top two projects were electronic medical records (EMR) and computerized physician order entry systems (CPOE), plus installing and fostering the use of wireless tablets and handheld PCs.

Mark Moroses, senior director of technical services and security officer at Maimonides Medical Center in New York City, is trying to improve patient care by upgrading his electronic medical record system, despite facing budget cuts.

"We were affected by the proposed Pataki cuts [in Medicare and Medicaid reimbursements], and we are starting a five-year renovation process," Moroses says, referring to Gov. George Pataki's proposed $1.9 billion reduction in the New York state healthcare budget.

"To get Housing and Urban Development financing, you have to maintain certain cash levels, which has also restricted our capital budget," Moroses says. "We've put several IT projects on the back burner because of that." Moroses is using an older Eclipsys 7000 for EMR — a way of keeping patient health information online rather than in paper-based charts.

"At one time, we were going to move to the newer Eclipsys SunRise Medical Record platform," Moroses says. "We also wanted to expand use of the ambulatory medical record and looked at implementing a new anesthesia medical record. Those got pushed back or postponed."

The computerization of traditionally paper-based medical records and the automated entry of labs and medications is such a highly charged area that Kaiser-Permanente Health System in Oakland, Calif., says it will shell out $1.8 billion to implement the technology to reduce medical errors for about 8.4 million patients. A 1999 Institute of Medicine report said that as many as 98,000 patients die each year from errors that are medically preventable.

"That study has spurred the issue of medical errors into the limelight for healthcare," Young says. "That's where IT has come into play for a lot of organizations in that they can be automating paper-based processes, whereas a paper-based process is quite prone to errors and misplacing of paper, misfiling or somebody getting access to it who shouldn't."

Dispensing meds and labs

Among the users implementing electronic physician order entry is Patsy Sublett, clinical systems manager for Danville Regional Health System in Virginia.

"Even before the Institute of Medicine report came out in 1999, we've been very much in tune to patient safety," Sublett says. "We heard that Siemens was developing a bar code [and software] point-of-care system and thought it would be neat if we could be the test site for that system."

Already, a lot of Danville's drugs contain bar codes, so dispensing them to patients whose wristbands could be similarly bar coded made sense. Considering that the hospital has used EMRs for some time and found that it reduced errors, Sublett decided to go ahead.

"We had to purchase wireless bar-code scanners and create a patient bracelet with a bar code on it," Sublett says. "The other big thing we had to do was, even though about 40% of our medications were coming into the facility with a bar code on them, there was another 60% that we had to repackage with a bar code."

After running the project for two months, Sublett presented to the hospital's board

"My biggest challenge is keeping up with what we are doing."

Jeff Pelot, CTO, Denver Health

and call me in the morning

of directors a recommendation to roll out the system hospitalwide.

"At that point it was just about on a daily basis that we could see a potential error that was being averted by the system," Sublett says.

Computer-based order-entry software creates alerts to remind nurses of measures they need to take before and after dispensing drugs. For instance, Sublett says, a nurse might receive an alert to check on patients after dispensing pain medication to see if the pain has diminished or one that compares drugs with other medications a customer is taking for adverse drug reactions.

At Denver Health, Pelot says order entry is his biggest project. "That's to ensure that the person inserting the order is the person giving the orders," Pelot says. "It's more of a patient safety and quality-of-care initiative than anything else. The whole idea behind it is to use the computer to prescribe medicine and avoid contraindications and reactions that could occur from drug errors. This could reduce the drug errors that could occur.

"A lot of times the wrong prescription is given because the pharmacy can't read the doctor's writing," he says.

CATRINA GENOVESE

Wired access anywhere, anytime

Todd Peterson, IS manager for Meriter Hospital in Madison, Wis., is looking at combining electronic data entry and medical records with tablet PCs and wireless technology.

"In the next phase of our Epic [software] project, we'll have to go with some type of wireless device at the bedside," Peterson says. "My gut feeling as I look at the technology is that the tablet PC is going to be the correct solution. To view the same data on a PDA, such as a Palm, you're just never going to have the screen that you're going to need."

Moroses, who already has EMR at Maimonides, also is looking into wireless and handheld use. "We've gotten CPOE and EMR up and gotten 100% physician use of those, so we've been pretty successful over the last two years," Moroses says. "What we are doing now is making those [records and methodologies] accessible anywhere, anytime."

Moroses, who had planned to use laptops to host his portable medical record, now is considering "leapfrogging that to the tablets. The big thing is the weight — if the nurses and physicians are going to carry these things around for a long period of time, a pound makes a difference."

Young says that in spite of wireless' advantages, there are several obstacles that will slow its adoption.

"The main area of concern is the security of the wireless infrastructure for hospitals, also in terms of device security," Young says. "Wireless or mobile devices have a very strong value proposition in healthcare settings. It's just really being able to resolve some of those security issues, as well as the mindset issues and workflow issues associated with adopting those types of devices. Doctors who are used to writing prescriptions on pad and paper would have to change their habits."

Those issues also affect CPOE and EMR.

"We know that we're going to have to move to bedside charting to get an [EMR] and we know we're going to be going with a wireless solution," says Carla Smith, executive vice president of the Healthcare Information and Management Systems Society, an industry association that helps members use IT and management systems to improve patient care.

"The industry is changing so much as it relates to wireless connectivity with the new standards coming out, and then there's a security issue side of that," Meriter Hospital's Peterson says. "What devices are we going to use, what protocol, and really how do you tie the telecommunications side and the data communications side into one acceptable solution for both ends?" ■

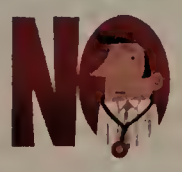
"We were affected by the proposed Pataki cuts [in Medicare and Medicaid reimbursements] . . . we've put several IT projects on the back burner."

Mark Moroses, senior director of technical services and security officer, Maimonides Medical Center

HEALTHCARE

Fact is . . .

Of companies that decided not to deploy computerized physician order entry, 52% cited physician and clinician resistance.



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User tips

Prescription for a successful healthcare project

1. Get buy-in of physicians and pharmacy before starting the project.

2. Partner with physicians and clinicians to build the vision of the project and the technology it uses.

3. Understand the goals and scope of the project before starting it.

4. By involving physicians and clinicians in the planning process, the expectations for the system will be in line with its capabilities.

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EDUCATION

Security lesson

University net execs face variety of security challenges.

■ BY JOHN COX AND TONI KISTNER

Just how seriously universities now take network security can be seen in one small, but telling incident: The CIO of Tulane University wouldn't talk about the subject.

"I have made it a policy to not report publicly about security issues," says John Lawson. One of the reasons for that is the potential divisiveness that security implementations can cause on campuses.

"Education has, at its core, a belief that information is meant to be shared and learned," Lawson says. "So now we have this conflict between the need to protect information because of the increased need to secure the safety of our constituents and the institution [on the one hand] and a fundamental principle...of sharing information to the benefit of all."

His comments reflect a big change in attitudes and actions about network security in academia.

Universities are increasingly aware of their vulnerabilities and the costs associated with successful attacks. A recent Emory University survey of 13 major U.S. universities found that 80% agreed that network security policies are very important, but only half of them are taking steps to combat the growing flood of security breaches. Staffing and budgeting were cited as the main obstacles.

A new worry is the legal liabilities created for a university when someone hijacks a school computer and uses it to launch attacks against networks and computers elsewhere on the Internet.

EDUCAUSE, a nonprofit group focused on advancing higher education through IT, now has a security task force that works with security experts and partners such as Internet2 to coordinate activities to improve information security throughout higher education.

Squeezed by an economy that's cut into state funding and private donations, universities are improving network security by reallocating funds and shifting priorities, says Rodney Petersen, security task force coordinator for EDUCAUSE. A main priority is hiring IT security officers to pull together school-wide security master plans, Petersen says. Anecdotal evidence suggests that many universities create these key jobs by re-assigning existing staff or re-allocating a vacant job slot for security, he says.

Dangerous gaps

A security audit at Georgia State University found that one in five users have no antivirus software installed, and an additional three in five users have outdated antivirus programs. It also found some department servers and PCs still run FTP or Web server software, which provides an open door to the network for anonymous users. Another problem was passwords that were too easy to guess. The university has more than 25,000 students in six schools and colleges, and more than 10,000 network devices.

The preliminary results spurred the university to create and fill the position of university information security officer. The university also launched a project to craft an overall security plan, with participation by colleges and departments through newly named information security representatives.

The user vulnerabilities found at Georgia State are typical, according to Petersen, who says they are top issues currently facing the group's members. "Desktops and laptops are not professionally administered," he says. "The freedom to allow faculty, staff, and students to alter system configurations and install software make PCs particularly vulnerable."

These vulnerabilities often are the basis of many of the attacks and disruptions that universities face. Most of these seem to originate outside the university community. Port scans, which are basically messages sent to each computer port as a first step in identifying specific weaknesses, are increasingly common, security officials say. Successful scans often are followed by attacks designed to exploit a specific weakness in Windows, Unix, Linux, sendmail, and other software components.

The most notorious recent example is the MS-Slammer worm attack (see www.nwfusion.com, DocFinder: 6329). At the University of Texas, network administrators, were alerted shortly before midnight on Friday, Jan. 24, by the school's automatic network monitoring systems. Slammer exploited a weakness in some versions of the Microsoft SQL Server database that many systems administrators worldwide had left unpatched.

The university had 40 unpatched hosts on its network, says Dan Updegrove, vice president of IT, University of Texas at Austin. About 90 minutes later, all University of Texas hosts generating rogue traffic were blocked at the Internet gateway. But at 8 a.m., the worm surfaced one last time on a student's laptop, which was infected when the student logged in from his dorm room.

To monitor their complex networks, universities now are doing more systematic and sophisticated "white hat" scanning: Network administrators run software programs to identify weaknesses. For example, the University of Texas performs several kinds of white-hat scans — scanning the entire network for one or a few specific vulnerabilities, or scanning specific subnets for known vulnerabilities. Sometimes, the administrators will scan new or reconfigured systems or recently patched systems.

There's been a buying binge at universities of such basic security products as firewalls, VPNs, intrusion-detection systems and vulnerability scanning software, EDUCAUSE's Petersen says.

Higher expectations

But university security managers also are demanding more from these vendors. One of the biggest security issues for Updegrove is "products delivered from vendors that are 'insecure out of the box" — whose configurations and settings are tuned to minimize difficulty in installing and initial operation." Open setting on Windows PCs and laptops, as well as on some Unix and Linux computers are good examples of bad examples.

What's needed, he says, is a shift in vendor thinking, so that vendors ship computers, PDAs, network hardware and servers with secure initial settings.

Just as important as having new and better tools, is the growing acceptance of them, and of the more stringent security policies and practices that go with them, among university department heads, faculty members and students. ■

EDUCATION

What else is hot?

Higher ed's higher IT budgets. A 2003 survey of 1,427 colleges and universities found the total budget for IT spending will increase this year by 5% compared with the 2001-2002 academic year, to more than $5.2 billion. But that's less than the 14% jump in last year's spending, fueled mainly by increased IT spending by administrative departments. The authors suggested the smaller increase might reflect a return to the historical pattern of higher IT spending by the academic groups.

Enrollment	Average budget '02–'03
Under 2,500	$527,800
2,501-10,000	$1.1 million
10,001-25,000	$2.3 million
over 25,000	$15.9 million

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Raising Arizona security. Arizona's three state universities will publish in August the results of a joint, $100,000 review of their computer network security. The Board of Regents commissioned the study shortly after hackers seized more than 50,000 Social Security numbers from a University of Texas database. The University of Arizona, with more than 30,000 computers, estimates it is hit 200,000 times per day by people searching for weaknesses. University officials said most of these attacks are attempts to access hard drives, which can be used to attack a third party, or to stash copyrighted material.

SPOT ILLUSTRATIONS JIM PAILLOT

Shop talk

Factories look for network answers.

■ BY PHIL HOCHMUTH AND JOHN FONTANA

Envision a modern-day manufacturing plant and chances are you conjure up images of large robotic arms and other automated machines.

Ever since Henry Ford introduced the production line manufacturing has been about pursuing efficiencies, and for years now computers have been behind some of the greatest advances.

Today manufacturers are turning to a wealth of network-based tools for the next step forward, everything from radio frequency ID (RFID) tags for sophisticated inventory control and supply chain management capabilities to online business-to-business e-commerce exchanges.

But manufacturers need to face an age-old network problem on the shop floor before they can take advantage of some of these sexy new options: swapping out a plethora of incompatible network technologies for corporate-standard Ethernet and IP.

The goal is a network that blurs the lines between carpeted company offices and tiled shop floors. Companies that achieve such integration then more easily can take advantage of innovations such as product life-cycle management (PLM) software to manage products from creation all the way through to retirement, potentially saving millions of dollars in the process.

"The basic lesson of networking in manufacturing is follow the infrastructure. Once it's in place the manufacturing plant will take advantage," says Bill Swanton, an analyst with AMR, who cites the adoption of Ethernet and wireless as examples.

Tangled factory floors

Today factories use many types of networks to control machinery, and those networks support an alphabet soup of proprietary and industry-specific protocols — such as the Manufacturing Automation Protocol, and the Control Information Protocol and Modbus.

The disparity increases maintenance costs and makes it difficult to harvest factory floor data, such as real-time statistics on production, for use in corporate planning.

As such, many manufacturers now are pursuing an all-Ethernet strategy, with office PCs plugging into the same infrastructure as the programmable logic controllers (PLC) that run factory equipment.

One such company is Newell Rubbermaid, the manufacturing conglomerate in Freeport, Ill., which produces industrial and home plastic goods, Calphalon cookware and Irwin power tools. The firm has had a range of network technologies in its factories over the years, including Ethernet and token-ring, and a number of proprietary control protocols. But Ethernet and IP slowly are taking over, says Dick Emford, the firm's lead network analyst.

Newell Rubbermaid has been able to connect its factory infrastructure to its corporate networks, but doing so requires complex protocol conversions and network bridges that can introduce latency. Ethernet puts everything on the same plane.

"There are fewer gateways to go through and fewer media transfers" when there is a common denominator, Emford says.

"It allows all parts of the business to share common back-end systems. The network just becomes a transport layer, connecting any server or any manufacturing facility together," he adds.

Ethernet is even being used for that factory floor staple — the punch clock. When Newell Rubbermaid employees come to work they scan magnetic ID badges instead of punching paper cards.

A LAN server records the hours and links to the company's payroll and accounting systems, speeding up payroll processing and other human resources administration tasks.

Standardizing on Ethernet makes IT management more efficient and lowers costs, Emford says. "Everyone is familiar with Ethernet vs. some of the proprietary stuff out there," he says. And while older technologies such as token-ring and proprietary PLC gear can be expensive, "I can get an Ethernet [network interface card] for around $50," he says.

Ethernet-enabled factory floors let aluminum and glass manufacturer G. James Pty., an Australian firm, run its plants and coordinate its manufacturing schedules more efficiently. Ethernet switches connect all the company's automation equipment, such as glass and aluminum cutting and shaping equipment, as well as gear devoted to post-manufacturing and shipping processes.

"Ethernet allows us to reach down into the PLCs so we can both log and update the running of the plants in real time," says David Moy, technical services manager at G. James. The availability of real-time data lets management adjust production schedules to be more in tune with demand from suppliers, he says.

But merging factory floor and office networks comes with some risk. "It becomes an issue of internal security," says Kim Smith, IT team leader, LAN and e-commerce for Goodyear Tire and Rubber in Akron, Ohio.

Goodyear, which has operations in 28 countries, is in the process of rolling out Ethernet in several manufacturing facilities. The tire maker's business network is based on Enterasys Networks equipment and this gear will be used to run and manage industrial processes and equipment in the plants, replacing a variety of proprietary technologies used to control heavy equipment.

With industrial equipment plugging into the same network as the company's business systems and the Internet, Goodyear is turning to internal firewall technology to regulate access, the same technology the company uses to keep hackers out of its worldwide network.

"We have to make certain that someone pushing a button on their PC doesn't set off some process on the factory floor — either by mistake or intentionally," Smith says.

Look, ma, no wires

The Ethernet incursion often is paralleled by the arrival of wireless technologies.

Companies are beginning to cut costs and speed reaction time by using wireless links to eliminate paper-based systems used to support everything from inventory to the production line.

Next-generation wireless technologies such as RFID — small radio tags used to track items — will alter the landscape when they get into full swing in 2005 and replace bar codes (see story, page 42). But even today wireless technologies are revolutionizing shop floors and warehouses.

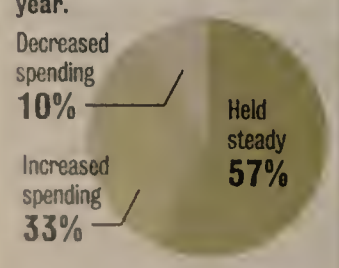
GM, for example, has installed wireless access on forklifts, letting assembly-line workers notify drivers when they need more materials. "We are reducing labor costs and improving our performance by exchanging this data

MANUFACTURING

What else is hot?

A recent study by the National Association of Manufacturers and Ernst & Young LLP shows that 33% of manufacturing companies increased their spending on e-business projects this year. Of those, 6% increased spending by more than 15%. The initial drivers for investment are productivity increases and cost savings in the sales/service chain and elsewhere in production systems, the study said. The greatest process improvements occurred in customer service, with 36% of respondents citing increases in the effectiveness of their order-management process. The study attributed a portion of the spending increases to the post-Y2K drop in IT costs.

Spending by manufacturers on e-business projects this year.



in real time," says Tony Scott, CTO of GM.

A recent IDC survey on wireless application adoption shows 68% of auto and aerospace manufacturers are using wireless or are in the initial stages of rollout. In discrete manufacturing the number is 42% and in process manufacturing 51%. The rest of the respondents said they either are evaluating wireless or will roll it out within 12 months.

"Our customers tell us they increase productivity by 40% on average with wireless applications," says Joy Doran, principal of Doran Associates, a systems integrator in East Hampton, Conn.

One customer she declined to name eliminated 12,000 paper forms that quality inspectors filed on a yearly basis. "Wireless allows companies to focus on the processes and pinpoint faults while saving time to take corrective action," she says.

Eastman Chemical knows that firsthand. In May, the Kingsport, Tenn., company equipped its seventh warehouse with a wireless inventory system. Dave Hrivnak, associate mobile projects manager, says the rollouts run about $50,000 but the payback is swift.

"Last year our physical inventory took two days with six people and 48 hours of overtime on the paper-based system," he says. "This year it took six people with wireless devices four hours."

Eastman uses industrial I-Safe devices from Symbol Technologies. The handhelds, which include a scanner and Microsoft's Pocket Internet Explorer, pump information into Eastman's back-end SAP system.

"It's a simple concept, but what we get is data reuse," Hrivnak says. "We can make the data available to others such as planners and shippers."

Experts say the biggest draw to wireless applications are those kinds of paybacks. "Mobility tends to pay for itself in a short time, it's measurable," says Richard Dean, an analyst with IDC. He says average ROI takes about nine months. "There is a gradual acceptance of mobile solutions because they are quite compelling," he says.

Wireless also is helping companies extend e-mail access to more workers. Newell Rubbermaid's Emford says some plants are rolling out 802.11-enabled PCs and laptops to plant floors, pushing e-mail beyond the cubicle. "It helps keep all employees better connected," he says.

Manage the product

Combine the network standardization effort with the new wireless infrastructure and you have a far-reaching network that can support lifecycle management tools.

Manufacturers say they hope to use PLM technology to create a holistic view of the manufacturing process that has never been available using piece parts: product data management tools, and procurement, supply chain and marketing applications. PLM tools that let data from those applications be combined and shared over the network or Internet will make that possible.

In essence, PLM lets the left hand know what the right hand is doing so manufacturing is less of a relay race and more of a collaborative effort.

"The real benefit comes when we lay [PLM] across the 17 companies to share designs and get products to market quicker. Today we reinvent the wheel way too many times."

Rick Blanchard, CIO, Genlyte Thomas

JOHN FITZGERALD

Particular attention is being paid to the design phase, where PLM lets engineers in global companies not only collaborate and reuse designs but share data with others in the manufacturing process.

While engineers are designing products, shop floor managers can be acquiring the tools needed on the assembly line and procurement managers can begin to acquire materials.

Collaboration is key because nearly 60% to 80% of production costs are accrued in the design phase, according to ARC Advisory Group, a consulting firm that specializes in advising manufacturing companies on strategies, trends and technology. The design phase also is becoming more of a group effort involving other companies and partners.

"There is a tremendous shift in that companies are far less vertical, therefore they need to collaborate," says John Moore, vice president and general manager for advisory services at ARC. A recent ARC study showed that 70% of corporations plan to increase their spending on PLM software over the next three years.

One of those is Genlyte Thomas, which manufactured and sold nearly $1 billion in lighting fixtures and controls in 2002. Genlyte, a combination of 17 autonomous companies and design teams in Louisville, Ky., is rolling out PLM to its design engineers across four plants at its flagship company, 99-year-old Lightolier. The tools consist of Autodesk Inventor, a 3-D modeling tool, and Autodesk Streamline, a Web-based collaboration tool that was deployed in February.

"Lightolier is our proof of concept," says Rick Blanchard, CIO of Genlyte. "The real benefit comes when we lay this across the 17 companies to share designs and get products to market quicker. Today we reinvent the wheel way too many times."

Blanchard estimates the PLM rollout cost between $6 million and $10 million, but expects a 10% growth in revenue and a 20% increase in productivity.

"The issue is not technology, it's a business issue," says Steve Shoaf, director of worldwide marketing for PLM at IBM, which along with partner Dassault Systems is a leading PLM vendor. "You have to change the way that you do business. You have to have tighter controls on what happens with your business processes."

That is the goal of Bertrandt, a $274 million provider of engineering services to the auto industry with 21 subsidiaries in Europe and one in Detroit. The company wants to improve product design and reduce time-to-market by integrating Catia 3-D design software and Enovia PLM software from Dassault with SAP R3 logistics and procurement applications.

"We want so-called concurrent engineering," says Bernhard Zechmann, manager of application strategy for Bertrandt.

"We want to have our different locations work together on one product. [Today] we have locations that are not able to synchronize their data, and they work separately," Zechmann adds.

The company so far has spent nearly $1.8 million on a pilot with Enovia at its core that will take three to five years to roll out. The goal is a process-centric system that creates a set of relationships between the different part designs used to construct a product and manage those relationships within a workflow that includes such steps as release and change management, bill of materials, and data exchange.

"What we are creating is a link between the process and the product," he says.

The robots still might hog all the annual report publicity shots, but the factory of the future will be driven by invisible deployments of software tools such as PLM, reaching out across geographically distributed organizations over industry-standard wired and wireless networks. ■

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BANKING

Asset protection

Banks look for better ways to plug security holes and ensure disaster recovery.

■ BY ELLEN MESSMER

Banks come in all shapes and sizes, from global financial services firms down to the smallest credit unions. But finding better ways to ensure security is a common concern. Large banks face another challenge — the need to deploy data-management tools as data volumes grow.

Finding ways to identify the holes in applications and patch them is a top priority because of the many computer worms and hacker assaults that are aimed at exploiting specific software vulnerabilities. "We have to apply patches nearly every day," says Bill Arnold, IT manager at Purdue Employees Federal Credit Union in West Lafayette, Ind.

The credit union uses a mix of Unix, Linux and Windows servers and desktops. While the patching job had been manual until recently, the bank now uses a tool from SecurityProfiling to automate the patch process for some of its computers. SecurityProfiling's software agents sit on servers and receive and install software patch updates.

However, Arnold says it's hard to feel the battle can be completely won. For example, Microsoft doesn't provide patches for some of the older software the credit union still uses. The organization eventually will upgrade to newer desktop software, but the patch management problem remains a tough one to solve.

A Deloitte & Touche survey shows IT security managers from 175 firms have big concerns about network attacks. According to the consultancy's 2003 Security Survey, only 13% of the industry's IT security professionals felt "extremely confident" that their organizations are shielded from Internet-based attacks. Moreover, 18% said they were "not very confident" their systems are safe from insider attacks. And 39% acknowledged that their systems had been compromised in some way last year.

"We're a pure Microsoft shop; our core concern is that we be up and running, and we want to patch in production as much as possible," says John Shields, senior vice president of e-business at Patelco Credit Union in San Francisco.

Patelco uses nCircle's IP360 appliance to scan Patelco's internal network for vulnerabilities. "We use the reports to generate the patches we need," Shields says.

Shields and Arnold want to see tighter integration between the patching tools, scanners and intrusion-detection systems they use so that security alerts from the IDSs are more relevant to their network traffic. Today, IDSs have little knowledge of the systems they are intended to protect.

Kirk Drake, CIO at National Institutes of Health Federal Credit Union in Bethesda, Md., says IDSs must improve to give reliable alerts about attacks. "They give you an insane amount of data, notifying you of about 200 to 300 alerts each day, but most of them are false positives," Drake says about the Sourcefire IDS that the credit union uses. "They trigger an alert, but if they knew what was really in your network and what was patched, it wouldn't be giving you that alert."

In recognition of that problem, Sourcefire is developing a network-discovery tool that will be able to share such information with the IDS to improve the quality of alerts. NCircle, Internet Security Systems and SecurityProfiling are other vendors actively pursuing tighter integration between IDSs and scanning tools.

Another challenge banks have is finding the people to maintain IDS implementations. For example, JP Morgan Chase wanted to make use of IDS but with no staff experienced with it, the choice was either to hire trained security specialists or choose a managed security service.

"We had no experience with IDS," says Jennifer Briggs, vice president of enterprise technology services for the bank in Newark, Del. A careful review of managed security services providers led JP Morgan Chase to Ubizen of Brussels, which had the kind of global presence the bank needed.

The destructive power of natural disasters, such as tornadoes and hurricanes, also is a major pre-occupation among IT managers. EECU, a Fort Worth, Texas, credit union, hosts its own Web servers, but for purposes of disaster recovery, the credit union recently decided to have Southwestern Bell host its online banking home page in a hardened Web-hosting facility in Dallas equipped to endure a category 3 hurricane.

Kenneth Mahan, EECU's IS manager, says the organization's goal is to preserve the online banking home page — the first place customers visit online — in the event of a catastrophe. That way, router tables can be changed to direct traffic to alternate servers and databases where customer information is stored.

In addition to security needs, the large banks are struggling with a problem of mammoth proportion: data. Banks need to centralize and analyze all the transaction data that streams through mainframes and servers. Many say they're storing data for longer times, both to meet complex privacy or capital-risk regulations and to better understand the bank's business.

"We're storing more historical information," says Doug Welch, senior manager of business intelligence for the Bank of Montreal. Moving 10 terabytes of data daily and analyzing it requires use of a new breed of tool for what's called high-volume "extraction, transfer and load" (ETL). A handful of vendors, such as Informatica, Essential and Ab Initio, offer tools for this.

Bank of Montreal uses Ab Initio tools for this heavy lifting of data as it's hauled across networks and "cleaned" for analysis. Another banking giant, KeyCorp, faces a similar challenge, according to Kevin Sexton, vice president and division manager in Cleveland.

"We don't want to use last month's data to make decisions today," says Sexton, who is aiming to process 4 to 5 terabytes of data daily instead of weekly or monthly by using the new breed of ETL tools. "We need to increase the data feeds to give business managers the information they need now."

KeyCorp uses a home-grown data-management tool. "We're going to see if these ETL tools, which are part of an aggressively growing niche in the marketplace, can do it better," Sexton says. ■

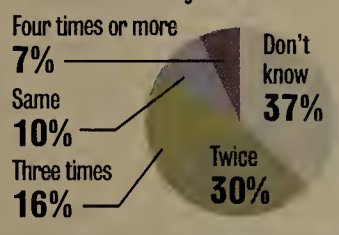
BANKING

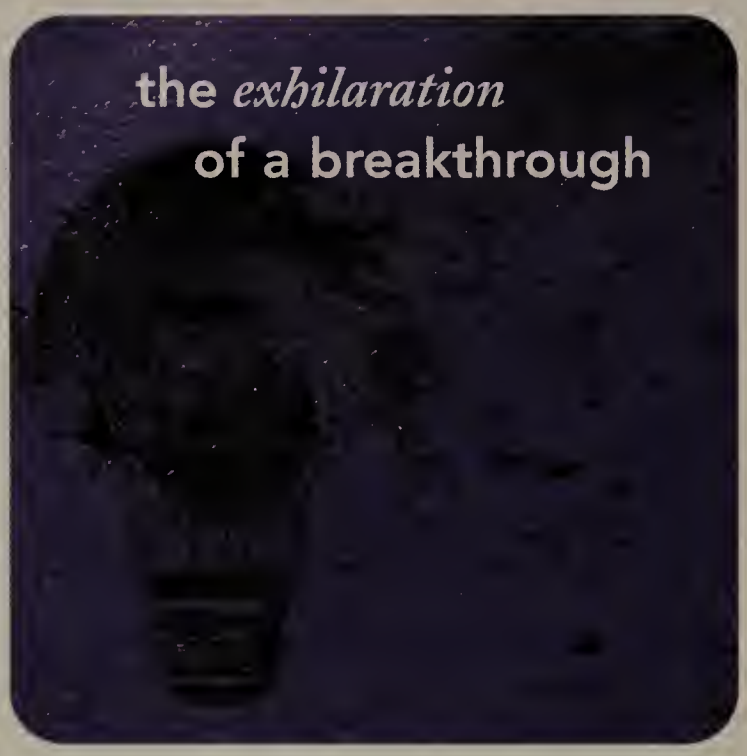
What else is hot?

Telecom dependencies BITS, the technical arm of the Financial Services Roundtable trade group, is working quietly with carriers and the federal government to boost network redundancy during a crisis such as the Sept. 11 attacks. In a summer meeting scheduled with Ameritech and the National Communication System, BITS might gain a lot of proprietary information about where vulnerabilities exist and how to mitigate them. There's hope the Chicago meeting might lead to the same process occurring in other major cities.

Banking on retention Nearly 33 million people will use online bill payment services in 2003, according to Gartner. Customers who pay their bills online are more likely to stay with the bank than the average customer.

Likelihood to stay with bank





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RETAIL

Playing tag

Retailers explore wireless labels for tracking merchandise and increasing sales opportunities.

■ BY ANN BEDNARZ AND DENISE DUBIE

Wireless asset-tracking systems are causing a stir throughout the ranks of traditionally IT-conservative retailers.

Wal-Mart is conducting field trials of wireless-enabled item labels that are embedded with tiny transmitters — technology that Gap already has piloted and Prada is parading in its flagship New York store. Other big-name retailers testing newfangled electronic tags include Ahold, Carrefour, The Home Depot, Marks & Spencer and Target.

These retailers are trying out systems that are based on radio frequency identification (RFID) technology, which transfers item-identification data between wireless transponders and readers.

RFID has been around for decades, a descendent of technology used during World War II to identify aircraft. Today, businesses use RFID gear to power toll-collection systems on highways, tag luggage at airports and track livestock.

In a retail setting, RFID tags function like bar codes on steroids. Item tags embedded with tiny chips and antennas store a unique identification number, called an electronic product code (ePC). RFID readers — which vary in format from handheld scanners to stationary tunnel-like devices that vary in size — transmit signals to activate the RFID tags and extract ePC data. When linked to management software, each ePC reveals characteristics about the item such as manufacturer, size and color. It also contains supply-chain information such as when the item was shipped, from where and its destination.

Unlike bar codes, multiple RFID tags can be read simultaneously and without direct contact. RFID tags also can identify individual items — a pair of pants as opposed to a style of pants, for example.

Among retailers, the allure of RFID is its potential to provide a real-time view of operations and reduce manual receiving and inventory management processes. In theory, retailers could track RFID-tagged products as they move from distribution centers to store rooms to store shelves. Shelf-mounted readers could alert managers when stock is getting low, or help sales clerks locate misplaced items.

"Basically, total asset visibility is what the goal is," says Michael Liard, senior analyst at research firm Venture Development.

The main benefit of RFID is visibility, agrees Geoff O'Neill, head of central logistics for new sales channels at department store chain Woolworths. The British retailer is testing RFID gear and software from Savi Technology to track palette movements. Today, it has 16,000 RFID tags in circulation and 28 fixed readers in its distribution center and in two of its 808 stores.

Combined with global positioning system (GPS) tools for tracking delivery vehicles, a wireless WAN and the company's existing warehouse management systems, mobile RFID equipment ensures the right merchandise is delivered to the right stores, he says.

"Visibility of stock and its whereabouts reduces the opportunity for theft of merchandise and distribution assets within our supply chain," O'Neill says. "Moreover, by ensuring that deliveries are complete and to the intended store we can run our business on lower inventories and offer better product availability to our customers."

He cautions that RFID is no magic bullet. "What we have learned during this project is that RFID is only a single component of a complex, integrated solution to a business problem: improving asset visibility," O'Neill says. "Through this project, and many others, RFID is proving itself to be robust enough for commercial application — but that it is only one piece of the jigsaw [puzzle]."

Market momentum

Interest in deploying RFID technology in the retail supply chain has increased significantly over the past few years, says Sanjay Sarma, chairman of research at Auto-ID Center, an industry-funded RFID research program at the Massachusetts Institute of Technology. The Auto-ID Center is partnering with the Uniform Code Council (UCC) and EAN International to form an organization called AutoID, which will be dedicated to creating and commercializing global standards for RFID tags.

Spurring interest in RFID is the emergence of inexpensive tags, network availability and the beginnings of standards, Sarma says. Over the past few years, vendors have worked to make RFID tags less expensive by stripping down the information stored on the tag and relying on the network to distribute information, he says.

"Taking memory off the tag makes the chip in the tag much smaller and therefore potentially makes the tag itself much more inexpensive," Sarma says. "All the chip then stores is a unique number, and instead you move the data on the network."

Fueled in part by falling prices, sales of RFID gear are growing. According to Venture Development, global shipments of RFID systems — including hardware, software and services — reached $965 million in 2002, up 8% annually since 2000. The firm expects the market to reach $2.7 billion by 2007.

While active deployments of RFID in retail settings are rare, many retailers are eyeing the technology.

At an AMR Research retail and consumer goods conference in April, only 10% of 250 attending executives said their companies are using or piloting systems enabled by RFID technology. However, 63% reported that their companies were evaluating such systems.

Jeff Carter, director of operations at online retailer BackcountryStore.com of Heber City, Utah, says his company isn't piloting or rolling out RFID. But the company is interested in the technology's potential to help it reduce loss and improve inventory processes through more accurate and readily available data. "We're tracking its progress and applications," Carter says.

Similarly, Bill Finefield is paying attention to RFID, but isn't ready to deploy it. "It is something on our radar screen," says Finefield, who is CIO of Navy Exchange Service Command, a Virginia Beach, Va., contractor that runs 112 stores serving U.S. Navy personnel around the globe. Finefield cites better inventory tracking, fewer manual processes in the distribution center and reduced product losses as potential incentives.

Losses incurred through process errors,

RETAIL

What else is hot?

POS upgrades: Aging point-of-sale gear is driving hardware and software investments, according to retail management consulting firm LakeWest Group. Respondents to the firm's annual survey of the 100 largest specialty retailers in the U.S. indicated their top three POS priorities for the next two years are increased customer flow-through at the register; improved information flow between stores and the corporate office; and improved connectivity. Deployments of Web-enabled POS systems are increasing: 55% of retailers surveyed are currently Web-enabled at their POS terminals, up from 27% in last year's survey.

Self-service checkout on the rise. The number of self-checkout systems installed in supermarkets, mass merchants, home improvement centers and drug stores grew 47% in 2002 compared with the year before, reports retail market analysis firm IHL Consulting Group. Recent installations at Albertson's, Kmart, Kroger and others suggest that between 15% and 40% of these stores' transactions now are being handled by self-checkout machines, the firm says.

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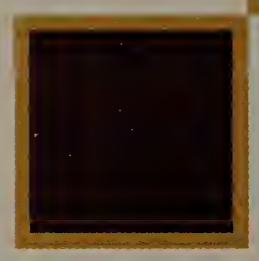

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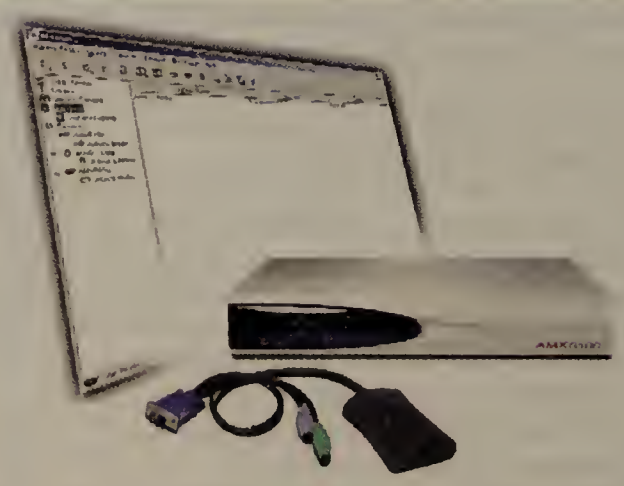

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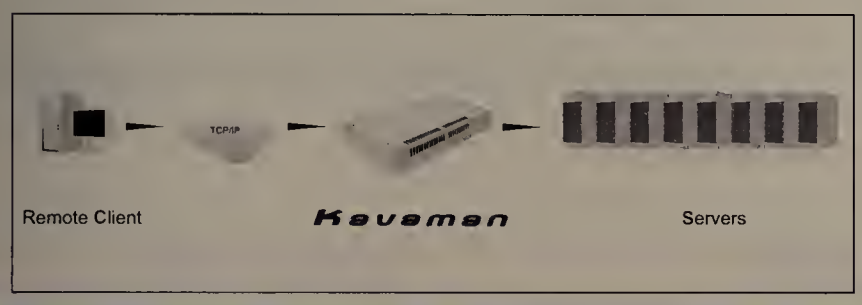

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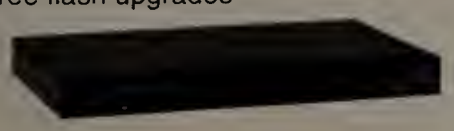

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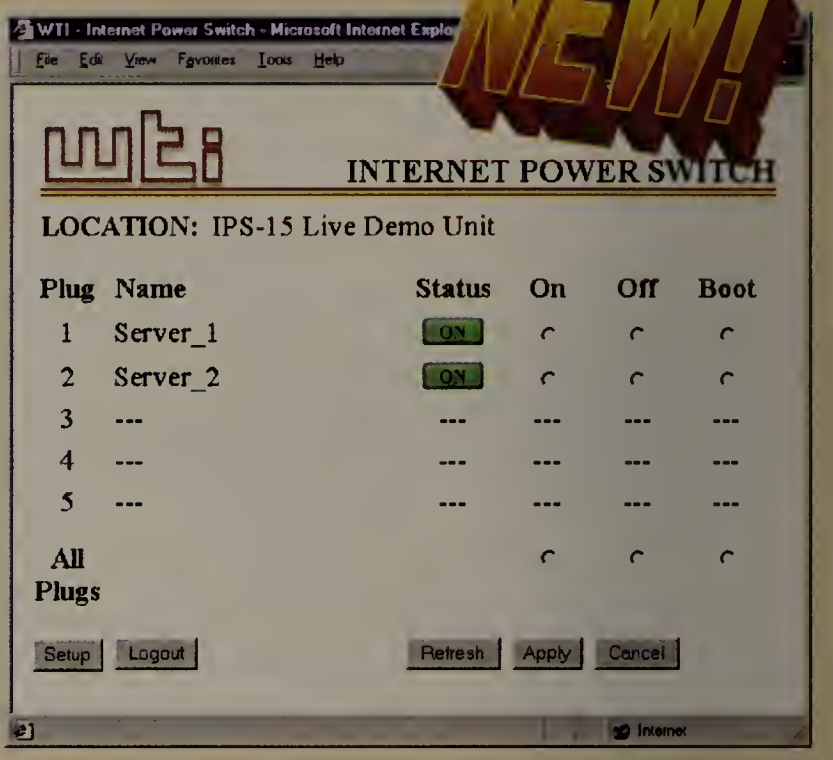

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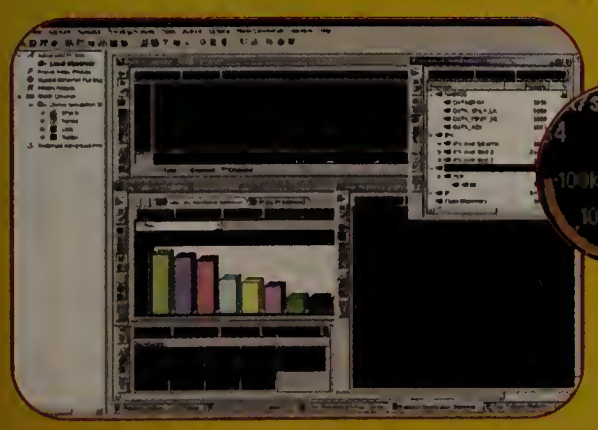

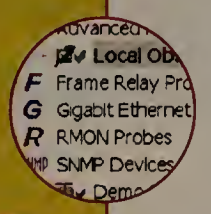

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IT Careers: E-tailers Give Away Network to Build Future

The shakeout over the past two years of start up e-tailers left a trail of dead companies and ideas. The survivors, however, are proving their mettle and have much bigger plans, including changing the way consumers look at their buying power.

Among the leaders are eBay, Amazon.com and Best Buy. eBay and Amazon.com are staking their futures not just on transactions, but also on selling and giving away their networks. eBay's claim is that its technology is the platform for e-commerce for 150,000 other businesses. The company is operating China's leading e-commerce site, EachNet, and eBay has established PayPal.com to automate online money transactions. In a sign of the times, eBay has acquired the former Novell Inc. headquarters, adding 2 million square feet for future office and research and development space. The company's new customer support center in British Columbia will add up to 600 jobs over the next two years.

Just as aggressive is Amazon.com, which is pushing its web services out into the economy in two ways. First, the company is *giving it away*. Hackers are welcome to use the system to create their own programs; 27,000 developers have signed on to abide by licensing rules and are creating programs that build on Amazon.com's technology.

That's great news, according to Rick Dalzell, senior vice president for worldwide architecture and platform software and CIO. Amazon will invest $200 million in technology this year, bringing the eight-year-old company's total technology investment to $1 billion. "Making our web services available ensures that people use our data," explained Andrew Herdener, spokesperson for the company. "By offering this to developers, we're creating a new network, a new web, based on Amazon.com."

Another tact undertaken by Amazon.com is its new subsidiary, Amazon Services Inc., which is selling turnkey e-commerce systems to other retailers. Already signed up are toysrus.com, circuitcity.com and target.com. The National Basketball Association is also operating its commerce site, nbastores.com, with Amazon technology.

The combination is a new way to shop – comparing bar code pricing, researching products, and defining what your shopping is and isn't.

Clark Becker, chief technology officer for Best Buy, believes this new type of shopping points to the IT profession's future. Better than 50% of Best Buy's customers shop online or do research at BestBuy.com before making an in-store purchase. There's always a place, even in downturns, for hiring those who are adaptable and have needed competencies. IT professionals need to think of themselves as "up-and-coming world-class programmers or designers, not as a world-class COBOL or Java programmers," Becker explains. "Technology will continue to change. Too many people define their careers by a technology skill and get caught having outdated skills instead of clear competencies and aptitudes."

For more information about IT Careers advertising, please contact:
Nancy Percival, Director, Recruitment Advertising
800.762.2977
500 Old Connecticut Path
Framingham, MA 01701
Produced by Carole R. Hedden

Manager of User Interface Software Development sought by NJ based Securities Dealer for Chicago, IL office. Must possess Bachelor's degree or equivalent in Computer Science or directly related field and 5 years exp. in software development/design/analysis. Exp. must include C/C++, JAVA, C#. Respond to: Human Resources Department, #KFP03-99, Knight Financial Products, 130 Cheshire Lane, Suite 102, Minnetonka, MN 55305.

Software Engineers: Design, develop, code, test and implement software systems & apps. per hardware interface specifications in Linux Kernel, Perl, Tel/Tk, AWK, Bourne Shell, Visual Source Safe, CVS, RCS utilizing Micro/RISC-processor designs and storage protocols-RAID iSCSI, SCSI, Fibre Channel, etc. Prevailing wage & benefits. Send resume to Susan Chitsaz, iVivity, Inc. 5555 Oakbrook Parkway, Ste. 280, Norcross, GA 30093. EOE.

Fluent, Inc., leading Computational Fluid Dynamics (CFD) Software developer, is looking for Technical Support Engineers to develop CFD applications. Candidates must have BS/MS with 2-yr exp. in CFD, optimizing exhaust gas recirculation. Please contact: rs@fluent.com. EOE

NVH Simulation Engineer wanted by Akebono Corp to develop/simulate analytical modeling of friction material and NVH. Minimum requirements: MS with 2-yr experience in NVH analysis and testing. 34385 W.12 Mile Rd. Farmington Hills, MI 4833.No phone calls or emails. EOE.

Machinery Network Administrator. Maintains main frame network and network controlled production software; maintains machinery software; mainteins comunication software responsible for comunication between main frame and machinery networks; trouble shoots hardware and software problems with machinery vendors in Germany and Italy; generates, converts, and downloads required format production files into machinery network for day to day production. 40hr/wk 7:00 to 4:00 P.M. $60,9444/yr Bachelor's degree in Engineering and Automation and Robotics required. Applicant must show proof of legal authority to work in the U.S. Send resumes to Illinois Department of Employment Security; 401 South State Street-7th North; Chicago Illinois 60605; Attention Brenda Kelly; Reference # V-IL 33403-K an emloyer paid ad; no calls - send 2 copies of both resume & cover letter.

COMPUTER ADMINISTRATOR

PricewaterhouseCoopers' (PwC) IFS practice has opportunities available for experienced professionals in the area of Digital Security. Positions require a bachelor's degree in CS, MIS or CE and 2 to 4 yrs technical experience with iPlanet, LDAP, Critical Path, Meta Directory, digital security systems, enterprise directory systems, UNIX and Windows NT is required. Job site/location: Tampa, FL. Interested candidates reference job code 44OMNKD & fax resume to "PWC US IT Recruiting" at (813) 348-7980. No phone calls please. Employer will only consider applicants authorized to work for any employer in the U.S.

Engineer - Customer Support Engineer - (FL) Analyze information to assist in the implementation of products. Make modifications based on customer needs & knowledge of systems & design. Monitor installed products. Provide training & customer support to clients. Req'd: Bach. Deg in Comp. Eng'g or Comp. Science, 3yrs. exp. in the job offered, or as a Systems or Field Eng. Must have exp. with installation of sophisticated telecommunications equipment & protocols. Must be fluent in Spanish & willing to travel extensively in No. and So. America. Resume to: NICE Systems, Inc. 301 Rte. 17 N., 10th Fl., Rutherford, NJ 07070. Attn: G. Farese.

Database Administrator wanted by IT company in NYC to admin, develop & maint overall database performance & programs; data conversion, devlp DB tools. Write/devlp scripts. Use Sybase, SQL Server, Visual Source Safe, VB, Java, Delphi, TCQ, Oracle. Resumes to HR Dept., Vitech Systems Group, Inc., 401 Park Ave South, NY, NY 10016.

PROGRAMMER ANALYSTS for Chicago, IL office. Design & Develop software applications using Oracle, C++, Sybase, XML, UML, Interwoven, Coolgen, ClearCase, ClearQuest, Plumtree, PVCS, UNIX. Bachelors req'd in Computers, Engineering or related field of study +2 yrs of related exp. 40 hrs/wk. Must have legal authority to work permanently in the U.S. Contact HR Manager, Infobahn Softworld,Inc. 3140 De La Cruz Boulevard, #108, Santaclara, CA 95054.

Programmer Analyst III. Provide programming support for mutual funds, annuities, retirement plans, and commission tracking/payment systems, including full life-cycle application support, analysis, design, development, system modification, testing, set-up, reporting & creation of documentation. Develop Microsoft client server & web development solutions for company's customers. Must have Bachelor's in Comp. Sci., Engg. or related, 1 year exp., & knowledge of NaviSys LifeCAD/MP (Home Office), Microsoft SQL Server 2000, & XSLT. Send resume to Connie Reynolds, Human Resources, Security Benefit Life Insurance Co., One Security Benefit Place, Topeka, KS 66636.

Junior Programmer Analyst. Assist in designing, implementing, maintaining and upgrading internet applications. Req: BS in Comp. Sci., Comp. Eng., or Elec. Eng. 40 hrs./wk. Job/Interview Site: Newport Beach, CA. Send resume to Restoration Media, Inc., 1300 Quail, #202, Newport Beach, CA 92660.

Software professionals wanted in Northern NJ offices. Positions responsible for arch & module design, & code creation for equity transaction systems. Candidates must have MS or BS with 5+ yrs exp in comp sci or related field. Knowledge of FIX preferred. Send resumes to ATTN: Job Code DVBRA001, HR, SunGard Trading Systems, 545 Washington Blvd, Jersey City, NJ 07310 or fax to 201-239-5780.

Computer Systems Administrator. Analyze/maintain/modify applications on IBM mainframe. Req. BS Math/Comp. Science/Rel. Field & 2 yrs exp in job/2 yrs exp as Sr. Analyst/Programmer. Spec. Req. Expertise in COBOL, DB2, CICS, CSF, Cordaptix & Utility Billing Systems. Send Resume: Louie G. Abad, EV3A, Inc., 412 Wellsley Court, Folsom, CA 95630(Jobsite).

Sales Engineer - Analyze tech req. of clients for comp. telecomm integ. systems in N. & S. Amer. Prepare tech/eng'g proposals, configurations & price quotes. Req: Bach. Deg. in Electronic or Elec. Eng'g. & 4 yrs. exp. sales eng'r/systems eng'r or in comp. telecomm integ. occup. 20% travel. Must have exp. / CTI tech sales or installation, LAN, WAN & PABX. Must be fluent in Spanish. Send resume to: NICE Systems, Inc., 301 Rte. 17 N., 10th Fl., Rutherford, NJ 07070. Attn: G. Farese.

TechNation Software Consulting, Inc, a software consulting company with its main place of business at Sioux Falls, SD has multiple positions for Software Professionals.

Sr. Software Engineers. BS in CS, or equivalent with more than 5 years of recent programming experience or MS in CS with more than 3 years of such experience. Duties entail programming, gathering user requirements and customization of software in either of a) Database Systems which involves database design, data modeling working in both front end as well as backend applications on Unix and Windows platforms. Or in b) systems side programming in Unix, C, C++ which involves product development, working on telecom protcols or development of device drivers.

Both positions require knowledge of allied Internet technologies like Java, JSP, XML, J2EE and ASP. **Unix Systems administrators**: BS in Computer Sciences or equivalent with atleast five years of experience in an enterprise environment. (i.e. more than 500 users) Duties include extensive use of Network Implementation and Administration, System Integration, Backup and recoveries, shell scripting and System Securities. Experience in Management of Enterprise Network Storage devices (SAN or NAS), HP and Solaris Servers, switches, HUBs and in Veritas NetBackup systems.

TechNation provides onsite consulting services to clients across the United States and hence a **key requirement** for all positions is that candidates must be willing to relocate across the country for periods between 3-6 months or as needed.

Send resumes to Rona Troff, 300 N. Dakota Ave. Suite #505-B, Sioux Falls, SD 57104 or email to rtroff@tnscinc.com. Fax: 530-733-2775.

Systems Integration Engineers (Multiple Openings). Responsible for design and development of a software management system that interacts with wireless products and components and for managing the access control and roaming of Bluetooth and 802.11 mobile devices. Duties include: development of public key infrastructures, secure authentication and authorization protocols, reviewing functional and design specifications,GUI development and programming. Daily work with C/C++, Perl, Linux kernal development, Radius, LDAP, and Unix systems. Development of SNMP functions including MIBs. Requirements: Master's in CS, IT, EE or related and two (2) years of experience in the job or in the related occupation of analyst, programmer, engineer or similar OR *BS/BA plus 5 years experience in job or related occupation in lieu of MS plus 2 yrs experience. Also, demonstrated expertise using C and Perl programming languages; UNIX platforms and Linux based operating systems; and Network Management & Operations using technologies such as SNMP and/or Packet Switched Networks. Offered salary is $90,500/year for full-time employment (min. 40 hours per week) and standard company benefits. EEO. Submit 2 resumes and respond to Case No.200201768, Labor Exchange Office,19 Staniford Street, 1st Floor, Boston, MA 02114.

Seeking qualified applicants for the following positions in Memphis, TN: Technical Advisor/Scientific Programmer. Provide technical advice and expertise for real time or batch scientific programming systems/applications. Requirements: Bachelor's degree or equivalent in computer science, operations research, mathematics, statistics or related quantitative discipline plus 7 years of experience in systems development, including 2 in scientific environment. Experience with ArcINFO, ArcVIEW and Visual Basic also required. *Master's degree in appropriate field will offset 2 years of general (non-scientific) experience. Submit resumes to Chris Holliday, Federal Express Corporation, 3680 Hacks Cross Road, Bldg H, 2nd Floor, Memphis, TN 38125. EOE M/F/D/V

Full-time Data Warehouse Architect: Architect, design, develop, and implement multidimensional databases. Responsible for developing ETL procedures in a SQL Server 7.0/2000 environment. Responsible for data modeling analysis, ODS, data marts, data warehouse architecture, database design, documentation, optimization, implementation and maintenance in an SQL server environment. Responsible for administration, development, support, and troubleshooting for MicroStrategy 7 Applications and for maintaining MicroStrategy Project schema and developing complex reports. Responsible for integration of multiple databases and multiple source systems into a single datawarehouse environment to enable business reporting and analysis. Analyze needs and requirements of existing and proposed systems, and develops technical, structural and organizational specifications. Work with SQL Server 7.0/2000, OLAP applications, DTS Package VB, ASP, C++, Lawson Financials, and Multidimensional tools. Must have Bachelor's degree in Computer Science, Mechanical Engineering, or related field. Must have 3 years experience in job offered or position with same duties. Send resume to Katie Weems, CareerBuilder, LLC, 8420 West Bryn Mawr Avenue, Suite 900, Chicago, Illinois 60631.

COBOL & ILE-RPG ANALYST/PROGRAMMER: Writes, updates and maintains programs written in COBOL/CICS for mainframe and RPG financial services clients. Creates and maintains IDMS/R and DB2 databases. Writes/fixes programs and database systems to establish compliance with ODBC or SQL OLEDB. Reviews work flow charts development by systems analysts/programmers to understand/advice on computer tasks performance. Creates description for programmers/analysts to understand program access to data. Writes physical database description for unauthorized access and tampering protection. Provides technical support/guidance for COBOL and RPG systems. Coordinates changes in computers databases. Creates & reviews changes in physical design of databases to assess effect on physical databases. Establishes database parameters. Calculates optimal values for parameters. Establishes computer access level for each database segment. Specifies used access level for retrieval, modification, deletion. Conducts quality control testing on codes and correcting errors. Generates prototype for potential clients to visualize applications. Job is in Miami, FL 40 hrs. weekly, 9-5 pm, $60,000/yr. Bachelor's degree or equivalent, based on education and/or experience, in Computer Information Systems or related field plus 2 years experience in job offered. Mail resume to: Data Industries, Inc., 6075 Sunset Drive, Suite #203, Miami, FL 33143. Attn: Philip Raifaizen.

COMPUTER

PricewaterhouseCoopers' (PwC) TAX practice has opportunities available for experienced professionals in the area of Computer Systems Analyst to provide technology solutions. Positions require a master's degree in CS or CE and 2 to 4 yrs related exp. Job site/location: Washington, DC. Interested candidates please reference job code 4TWTAA & fax resume to "PWC US IT Recruiting" at (813) 348-7980. No phone calls please. Employer will only consider applicants authorized to work for any employer in the U.S.

Mainframe Analyst/Programmer: Writes, updates and maintains programs written in COBOL/CICS for mainframe and financial services clients. Creates and maintains IDMS/R databases. Writes/fixes programs and databases to avoid Y2K problem. Review work flow charts development by system analysts/programmers to understand/advise on the computer tasks to perform. Creates a description for programmers/systems analysts to understand how program should access data. Writes physical database description to protect it from unauthorized access and tampering. Provides technical support and guidance for COBOL Systems. Coordinates changes in computer databases. Reviews changes in physical design of databases to assess effect on physical databases. Establishes database parameters. Calculates optimal values for these parameters. Establishes computer access level for each segement of database. Specifies user access level for retrieval, modification, deletion. Conducts quality control testing on codes and correcting errors. Enters codes to create production databases and utilities programs to monitor performance of database. Modifies data in fine-tuning database operations. Generates prototype for potential clients to visualize applications. Three positions available. Job is in Miami, FL., 40 hrs., weekly, 9-5pm, $60,000/yr. Bachelor's degree or equivalent based on education and/or experience in Computer Science, Computer Information Systems or other related field plus two years of experience in job offered. Mail resume to SMX Services & Consulting, Inc., 7220 NW 36th St. Suite #421, Miami, FL 33166. Attn: Amneris Hampton.

Blackbaud, Inc., the leader in bringing technology to non-profit organizations and educational institutions, seeks qualified individuals for the following positions at our Charleston, South Carolina headquarters:

Programmer Analyst: Design, write, and maintain code in Visual Basic for Blackbaud internal systems and create and perform unit tests of all existing code.

Software Engineer: Design and develop new software products and enhance existing products using Visual Basic. Program code for user interface, COM layer and database applications.

Conversion Programmer: Map and convert data, manage large conversion projects and serve as an escalation resource for the production team using Visual Basic and SQL. Job may be performed offsite/telecommuting.

Positions require a Bachelor's Degree in Computer Science, Engineering, or a related field as well as previous experience. Interested applicants should e-mail resumes to recruiting@blackbaud.com using reference code "BB".

Systems Analyst, Designer & Developer

Design & develop programs for special business needs using Oracle, Sybase, Informix, SQL Server, Progress, PowerBuilder, Visual Basic, C, C++, SQL, PL/SQL, HTML, XML, XSL, Perl. Carry out system feasibility studies. Develop business portals for conducting business by internet & intranet using Websphere, WebLogic, JRun, XML & Java. Deploy business applications on servers & clients. Manage database performance & tuning. Deploy various web services for enterprise functions. Must be willing to travel throughout US as needed for short or long-term assignments. Must have B.S. or foreign equiv. in Comp Sci, Math, Engineering, or Physics + 1 yr exp in job offered or as Software Engr. or Systems Analyst. 8am-5pm, M-F OT as needed. $68,000/yr Reply to Job Order #WEB337582 Site Manager, Beaver County CareerLink, 2103 Ninth Ave. Beaver Falls, PA 15010-3957

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NET2S is a leading International e-business, information technology, and communication infrastructure consulting firm. We are currently seeking for the following positions.

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Computer Prgmr: Design, implement modifications to existing programs; dev, & program modules. Work w/manufacturing engr to define process requirements & convert req. into design specs. Schedule work timetable. Test & debug programs/code; analyze program performance & devise necessary corrections & improvements. Recommend changes in methods or procedures & present solutions. Customize ERP system using Oracle database. BS (or foreign equiv.) in Computer Science/ Engg. Exp. req. 2 yrs in job offered or 2yrs as Pgmr/Sys. Analyst. 2yrs exp. in customizing ERP software using Oracle Database req. Hrs 8-5, M-F, 40hrs/wk. Resumes to: Ann Llimo GM, EMS Solutions, 4355 International Blvd, Ste 200, Norcross, GA 30093

Programmer Analyst with technical applications experience with VB, SQL, Access, Crystal Reports and/or other technologies. Send resume to Smithers Scientific Services, Inc., Attn: KES, Req No. 456, 425 West Market St., Akron, OH 44313-2099. EOE.

Project Manager
Doctors Medcare seeks Project Manager in Gadsden, AL. Project mgt to implement + dev I.T. systems; Ensure delivery on time & budget; Eval. + recommend software +hardware systems; Plan, install, continued dev and support of systems; Project initiation, definition, business analysis, process modeling; Produce functional specs; Testing + maintenance. Must hold Masters in CS, Eng'g or related field + 6 yrs relevant exp. Résumé to Doctors Medcare, H.R., PO Box 1397, 604 Smith Street, Albertville, AL 35950.

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SBI is looking for the following positions for its offices in Houston, TX, San Francisco, CA, Warren, NJ, Salt Lake City, UT and Portland, OR: Programmer Analysts, Technical Architects, Technical Consultants, Business Strategists, Systems Analysts, Software Engineers, Art Director, resumes by email or fax only to HR, SBI 2825 East Cottonwood Parkway, Suite 480, Salt Lake City, UT 84121:
careers@sbiandcompany.com; Fax (801) 733-3201.

Database/Systems Administrator to design, develop, test, install, deploy, integrate, enhance & administer databases applying knowledge of database management systems such as Oracle, PERL, SQL, PL/SQL, Java/XML & VB/ ASP/SQL Server environments. Establish & maintain security & integrity controls. Reqd. B.S.C.S & 4 yrs exp. M-F, 40hrs/wk. Send resume to S. Arsenyev, Alazar, LLC, Ref. #99J, 1815 Pennsylvania Ave., Ste 1101, Washington, DC 20006.

Tobin International, Ltd. seeks applicants for the position of Senior Software Engineer in Denver, CO to design and develop GIS web-based enterprise software products using J2EE technology. Requirements for this position include a bachelor's degree in computer science, computer engineering or a related field and software experience. Also required is a working knowledge of designing and developing web-based enterprise products using J2EE technology, Oracle, UML and application servers. Respond by resume to Mary Kimball, Tobin International, 1625 Broadway, Ste. 500, Denver, CO 80202.

Indo-American Business Corporation (a financial sector), is looking for:

Financial Analyst: Should have a bachelor's degree in computer science/accounting with 2 years experience in financial analysis, planning, investment analysis & interpreting data, report analysis, MIS and use computer for decision making

We accept foreign education equivalent of the degree, or the degree equivalent in education and experience.

Send Resume Indo-American Business Corporation, 415 N Cass Ave. Westmont, IL 60559.

SAP PROGRAMMERS
ZyQuest, Inc., a leader in IT Consulting is seeking experienced Senior Level SAP consultants. Candidates must have the following SAP skills: BW 3.1c, ABAP/4, SAP R/3, BDC, RFC, BAPI, and IDOC's. The successful candidate ideally will have 2+ years experience in SAP and must be willing to travel. We offer exciting opportunities for professional growth and a flexible compensation/benefits package. Interested? Please mail your resume in confidence to 1580 Mid-Valley Drive, Ste 102, De Pere, WI 54115. EOE

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Periodicals postage paid at Southborough, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #40063800. Network World (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 118 Turnpike Road, Southborough, MA 01772-9108.

Network World is distributed free of charge in the U.S. to qualified management or professionals.

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USPS735-730

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BackSpin Mark Gibbs

What spam really costs, Part II

I hope you did the homework I assigned last week. I wanted you to find out:

- What your data services cost per month.
- What percentage of your available WAN bandwidth actually is used.
- What percentage of that bandwidth is used for e-mail.
- What storage costs you.
- How much mail your users send and receive each day.
- How much spam each user gets each day.
- How long it takes a user to deal with a single piece of spam.

Those were the basics. To complete this exercise you'll also need to know the average fully burdened cost of an employee (taking into account insurance, tax, benefits, etc.). Now divide that by the average number of work hours per year to find the fully burdened average employee hourly cost.

For my calculations, I'll use some averages derived from a number of sources that might or might not be consistent with the values for your operation.

First we'll calculate productivity costs. If the average user (working 220 days per year at a fully burdened annual cost of $71,440) receives 100 messages per day of which 30% are spam and the average time required to handle a piece of spam is 5 seconds, then the average cost to handle spam per user, per day, is $1.69.

This means that for 1,000 users the total cost of productivity loss per annum will be (hold on to your seats) $372,083 or $372 per employee! But while productivity loss is by far your biggest cost, the others are nothing to sniff at.

If the cost of Internet connectivity per month runs to, say, $6,000 (servicing internal users and telecommuters and mobile workers) and e-mail uses 75% of the bandwidth and spam uses 30% of that, the total cost of bandwidth used by spam (spamwidth?) per year will be $16,200.

Next, if the average message size is 50K bytes and the cost of storage per month, per gigabyte, (including management costs) is 50 cents, then it will cost $9,000 per year to store spam.

Finally, support costs: Assuming the average cost of support per user, per year, is $250 and 5% of that can be allocated to solving spam-related issues, we'll be spending $13 per user, per year, for a total of $12,500 per annum.

If we add all of these annual costs — connectivity at $16,200, storage at $9,000, support at $12,500 and the big one, productivity, at $372,083 — we get a total cost of spam per year for a 1,000-seat operation of $409,783! That is more than $409 per employee!

I've made a spreadsheet available at www.nwfusion.com, DocFinder: 6644, so you can plug in your own figures. My spreadsheet also goes further by extrapolating the model over the next five years for growth in connectivity costs, storage costs, support costs and spam.

Note that if spam represents 30% of messages today and the spam growth rate is 35% per annum, spam will become 99.6% of e-mail messages by 2007!

The point of this exercise is to build a case for action. Armed with this kind of analysis, you can approach the CEO and present an argument for investing in messaging management services. Along with the financial argument you should be able to present the liability issue: Your organization could find itself in a sexual harassment case for not actively stopping spam.

Note that I used the term "message management services" rather than "anti-spam services" because just minimizing spam is not enough. That is just one component of your messaging problems. Other issues include confidentiality, personal use, improper content and violations of your acceptable use policy.

That's this week's homework. Hand in your assignment as soon as you can and I'll give you a grade.

Report to the principal at backspin@gibbs.com.

'NetBuzz News, insights, opinions and oddities

By Paul McNamara

A bunch of Network World Fusion readers apparently have never heard the old adage about never saying never.

The evidence can be seen in an online poll conducted throughout June that asked: "Have you ever paid for content on the Web?"

Of the 3,768 individuals who considered five possible replies, a resounding 57% chose: "Never, nor will I."

Perhaps a number of these readers are well along in their years or hopelessly set in their ways, but the rest — presumably the vast majority — might want to consider a longer view of the matter: After all, never could be an extremely long time. And who knows what might pop up on the Web tomorrow that would have even these never-never types fumbling for their credit cards.

Of course, the other real possibility is that these folks said what they meant and meant what they said, which cannot be good news for online content creators who have dreams of turning a buck or two . . . not to mention bills to pay.

Before we go much further, it's worth noting that Buzz has long been dismissive of online polls for the obvious reason that a self-selected sample of respondents discounts any claim to scientific validity. However, I'm told this particular poll was among the more popular ever conducted on Fusion, so let's suspend disbelief and peer a bit deeper into the results.

Ten percent of respondents said they currently pay for content online. This number struck me as surprisingly high, even accounting for the fact that the *Network World* audience is more affluent, better educated and more active online than the general populace. (Of course, we have no way of knowing what portion of that 10% is patronizing purveyors of the Internet's most popular content: pornography.)

Another 8% said they have bought reports online, leading me to wonder why I haven't written any reports as of late.

Five percent of respondents said they would consider coughing up cash for online content if the content came devoid of advertising. This is not a ringing endorsement of the ad-free model but shouldn't come as a surprise, because we all are accustomed to advertising and most accept it as a reasonable price to pay.

The fifth and final option — "I would consider paying if I could not get the content anywhere else" — garnered the second-highest vote total at 20%.

This was the safe choice among the five, what with its cushy fudge words "consider" and "if."

But it also got to the crux of the problem for online content providers: There's too much content out there, too much of it looks the same, and almost all of it is free.

Buzz is with that 10% who currently pay for online content (and, no, it's not porn). Sports and politics are two of my favorite pastimes, and they account for a good deal of my limited pleasure reading.

I'll check out ESPN.com three or four times a week, but have resisted all of that site's pleadings to pony up for "premium content." I've been tempted, yes, but not enough to hand over the dough.

The reason is free sports news and opinion couldn't possibly be in more abundant supply.

Politics is another matter. At a time when mainstream media outlets — TV and radio, in particular — are increasingly dominated by conservative bombast, there are few places a knee-jerk liberal can get his fix . . . even online. Salon is one such place, and while much of its content is free, the premium stuff — the forbidden fruit — kept calling for my credit card number until I could stand it no longer.

Basic economics: supply and demand.

E-mail is still free. The address is buzz@nww.com.

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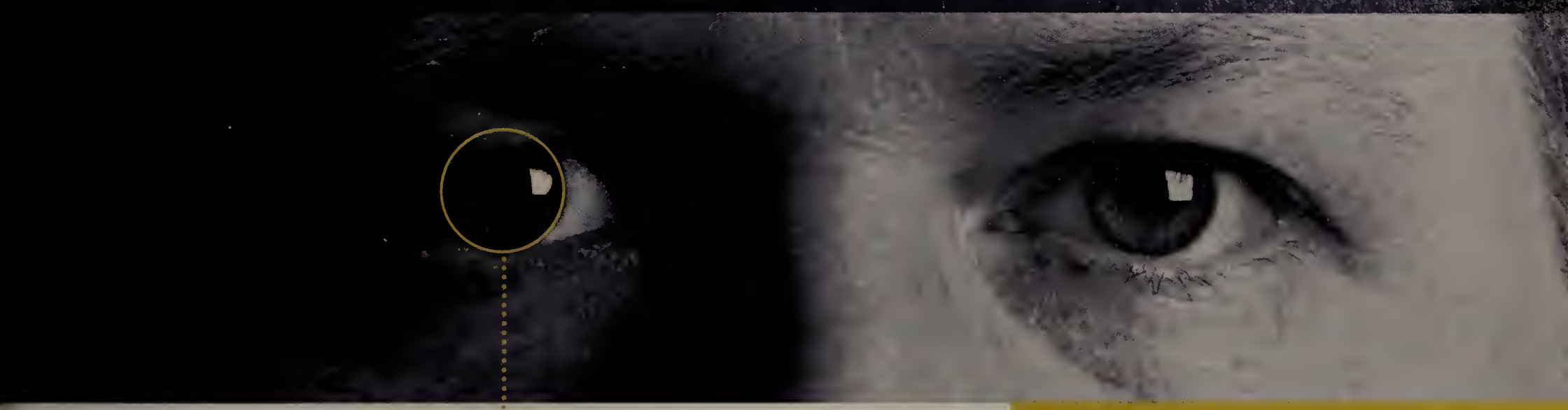

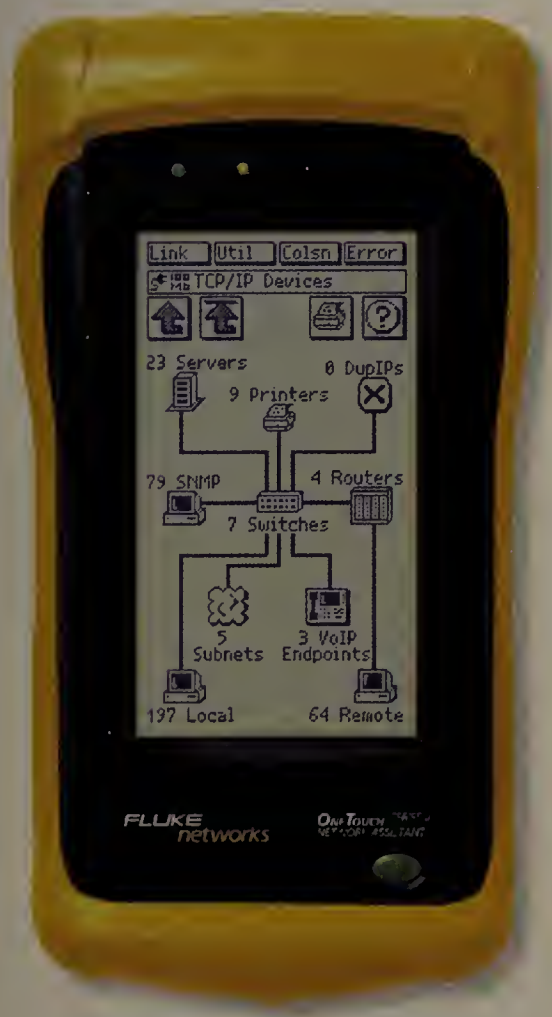

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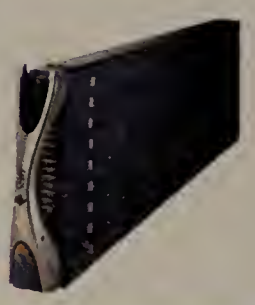

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